THE POLAR TIMES

Fall-Winter 2002

The President's Letter

At this time we are nearing the conclusion of my term, and the elections are in progress as of this writing for new Board members and President.

About seven years ago, Brian Shoemaker's enthusiasm and dedication to the American Polar Society enticed me to run for the Board of Governors and subsequently for President. The last two years have been a rewarding and exciting time for me as President of the American Polar Society.

In fact, it has been an honor to serve the Society, its ideals and goals, and it has been a privilege to work with all the dedicated individuals who make the Society work.

However, these two years presented a particular challenge to all of us after we saw Capt. Brian Shoemaker retire as our Secretary to follow up on his project of Polar Oral History. Significant changes took place for the Society. A new Constitution and By-Laws were enacted as of the Board of Governors' meeting in October 2000. Furthermore, the administrative, day-to-day operations of the American Polar Society and the publication of *The Polar Times* saw a dramatic change through the introduction of a number of very dedicated individuals who volunteered their time and effort to help and support the Society.

The Polar Times has continued to be an excellent production, generating excitement among those of us who are concerned about the polar regions, and are interested in the research and exploration that are conducted in the Arctic and Antarctic.

We have had two successful Symposia, and now the 3rd Symposium of the American Polar Society is being planned for October 2003. I am looking forward to seeing you there.

With my very best wishes,

Gisela

OUR FRONT COVER

Construction of Dome Concordia (see story p. 3)

Dr. Gisela Dreschhoff

American Polar Society

The American Polar Society was founded Nov. 29, 1934, to band together all persons interested in polar exploration. Membership dues are $15 a year ($17, foreign), and entitle members to receive ***The Polar Times*** twice a year. The American Polar Society is classified as a tax exempt organization under Sec 501(C)3 of the IRS Code. For more information about the American Polar Society, contact **Capt. FRANK STOKES, APS Secretary,** at 1.850.497.0759 or send email to *sto346@yahoo.com.*

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Secretary's Letter

My letter to the membership has one main purpose this time and that is to put the membership on alert for our symposium to be held in October 2003.

At the present time it is scheduled to be held at the Byrd Polar Research Center at Ohio State in Columbus, Ohio. Arrangements are still being made.

The subject of the symposium will be "The Past and Future Role of Women in the Polar Regions, Administrative and Operational."

For many years, especially in Antarctica, women played a minor role in the conquest of the poles, or so it appeared. In actual fact, women have always been at the frontiers in every corner of the world. Our symposium will highlight the early female pioneers at the Poles and their future roles as humanity moves to the far north and the far south.

Please mark off early October of 2003 on your calendar. All details including the exact dates will be available in our next issue of *Polar Times*.

You will not want to miss this exciting and informative symposium. We are working on getting, as keynote speaker, at least one or two of these courageous women who broke the barrier—or should I say ice—for women explorers at the poles.

Thank you.

Frank Stokes

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See page 31 for details.

The Polar Times

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Dome Concordia: A Village in the Heart of the Antarctic

By Lucia S. Simion

EDITOR'S NOTE: *This special report on Concordia, the joint French-Italian station being constructed in Antarctica's interior, is courtesy of Paris-based journalist Lucia Simion, who became "hooked" on Antarctica after reading Ernest Shackleton's "South." She has visited "Dome C" twice.*

"Can you see the station's towers over there?"

Speaking through the intercom of the Kenn Borek Twin Otter, the pilot points to the horizon, then looks at me, sitting beside him in the cockpit.

"Look...there are just two tiny dots," he insists.

I try to look as far as I can, but the polar plateau seems just like the surface of a strange moon: barren, flat and white. There's nothing but ice, an immense expanse of ice under a big sky of pale blue with absolutely no clouds. It's like flying over a world still waiting to be created.

But the pilot is right. Far away on the white surface are some black, green and orange dots. They're the tents and containers of Dome C, the building site of Concordia station. Two towers are right beside them. Dome C, at last!

I traveled ten days by boat and plane from Europe to reach this place at the end of the world.

A few minutes later we land on the ice with a few bumps. At the camp, everybody comes out to welcome us. The arrival of the Twin Otter is always celebrated, for everyone is happy to see newcomers.

We are at 75° 06' S, 123° 23' E, on top of an icy dome at 3,250 metres (10,400 feet) above sea level. The temperature is -40° Celsius (-40° F). The air is pure as spring water and filled with tiny ice crystals glowing like stardust. The snow crackles under our feet.

Three flags are flying over Dome C headquarters: green, white and red for Italy; blue, white and red for France; and deep blue with fifteen gold stars for the European Union, for it is here at Dome C—17,000 km (10,600 miles) from Rome and Paris—that the Italian and French polar programs agreed in 1993 to build a new permanent research station at a cost of 31 million euros. The station is to be inaugurated in 2005.

Along with the U.S. Amundsen-Scott South Pole Station and Russia's Vostok Station, Concordia will be the third base in the heart of the Antarctic. France's Dumont d'Urville station is 1,200 km (750 miles) away to the north, and the Italian base, Terra Nova Bay, is 1,100 km (680 miles) to the northeast. The South Pole is 1,500 km (930 miles) southwest.

© Lucia Simion

Construction on Dome Concordia is under way.

"Dome C is considered one of the best spots for scientific research in Antarctica," says Mario Zucchelli, director of the Italian polar program. A layer of ice more than 3 kilometers (9,800 feet) thick offers great potential for climatic reconstruction over the last 800,000 years, while the high altitude and very cold and dry air are perfect conditions for submillimetric infrared astronomy, and the long days and long nights are ideal for astronomical observations.

> *"Dome C is considered one of the best spots for scientific research in Antarctica."*

A program named Concordiastro, run by Eric Fossat at the Department of Astrophysics at France's Nice University-CNRS, is testing the site as part of a worldwide campaign to qualify all the sites of large modern telescopes worldwide. For this purpose, two wooden platforms 5 metres (16 feet) high, designed by architect Jean Dubourg at the Observatory of the Côte d'Azur, will be mounted beside the Concordia station. Each will hold three optical telescopes by means of which the turbulence and scintillation will be tested; astroseismology and photometric studies will also be performed on Alpha Centauri, a very bright star. "If the results are good, Dome C will then be a candidate to host one of the largest telescopes in the world, 50 or 100 meters (Editor's note: that's correct, 50 or 100 meters) in diameter," says Fossat.

Paolo G. Calisse, an Italian astronomer now at the University of New South Wales in Australia, explains that his university has started testing Dome C's potential in collaboration with the U.S. National Science Foundation (NSF) and the Center for Astrophysical Research in Antarctica (CARA), in parallel with an astrophysical testing program at South Pole, begun in 1995. An instrument called COBBER (Cloud Cover Monitor) is watching the sky at Dome C 24 hours a day via an automated camera.

Since it is far from any marine perturbations, Dome C is an ideal spot for studying seismology and geomagnetism as well. Likewise, its isolation and severe climate makes it a good place to study small groups of people in conditions simi-

(Continued on page 4)

© Lucia Simon

Framework of Dome Condordia.

lar to those encountered in orbital space stations, and ESA (the European Space Agency) has already focused its interest on Dome C to study human behavior for missions bound to Mars.

Dome C is also a very good place to search for micrometeorites, with dimensions between 25 microns and 500 microns. "Almost 6,000 tons of this extraterrestrial dust falls on our planet every year, compared to the mere ten tons of meteorites with dimensions larger than one centimetre," explains Jean Duprat of the France's Centre de Spectrométrie Nucléaire et Spectrométrie de Masse located in Orsay, near Paris. Duprat and his collegue Cécile Engrand spent fifteen days in Dome C in January 2002 in search of micrometeorites. They collected 10 cubic meters (13 cubic yards) of snow and found some 200 celestial grains. "They will help us to better understand the origin of our solar system," says Duprat.

Italian geophysicist Ignazio Tabacco of the University of Milano mapped by radar altimeter the bedrock at Dome C by flying Twin Otters over an area as wide as 120 x 80 km (75 x 50 miles), to study hills, valleys and 14 freshwater lakes hidden by the thick layer of ice. "The largest lake is nearly 50 km (30 miles) long and 30 km (18 miles) wide, buried under 4,150 metres (13,600 feet) of ice," says Tabacco. "It is located some 100 km (60 miles) north of Dome C. We called it Concordia—it's the second-largest subglacial lake in Antarctica after Lake Vostok. We still don't know its depth since water is not transparent to radar waves." Next year Tabacco plans to go back to Dome C to find out the depth of Lake Concordia using seismological tests.

The Dome C camp is made up of containers and Weatherhaven tents. Electricity is provided by two Caterpillar 180 Kv generators. Water for cooking and washing (4,000 liters—or 1,000 gallons—per day) is made by melting snow, while drinking water comes from the desalinization plant at Dumont d'Urville station. Food supplies, including the drinking water, and fuel and building materials for Concordia are transported aboard the "Raid," a special convoy of Caterpillar trucks adapted to polar conditions and equipped with GPS navigation systems. Run by Patrice Godon of the French polar program, the truck traverse takes 20 days to make a round-trip from Dumont d'Urville. Three trips are made every austral summer.

Inside Dome C's main building, the atmosphere is friendly, noisy and warm. Beside French and Italian, many other languages are spoken in this Antarctic melting pot: "During the austral summer between 40 and 50 people coming from ten different European countries and from Australia live at Dome C," says Italian Augusto Lori, the camp manager. Most Dome C residents are Italian or French, but the station is becoming a very international facility.

Inside Dome C's main building, the atmosphere is friendly, noisy and warm.

Since 1999, the EPICA project (European Project for Ice Coring in Antarctica), funded by the European Community and by ten individual countries, has drawn researchers and technicians from all over Europe, including Russia. EPICA is one of the most successful drilling projects ever performed in the Antarctic: in January 2002, an ice core extracted from the depth of 2,800 metres (9,200 feet) was dated as being 530,000 years old: "It is the oldest ice yet known on Earth," says Eric Wolff of the British Antarctic Survey, who was EPICA Chief Scientist at Dome C from November 2001 to February 2002. Dr. Wolff was assisted by an international team of 22 glaciologists and drillers, who extracted and processed nine tons of ice cores, dispatched to many different labs around Europe.

"The Antarctic ice gives us much information about the climatic changes at the planetary level and about the glacial-interglacial events," explains glaciologist Jean Jouzel of the Laboratoire de Modélisation du Climat et de l'Environnement at Saclay near Paris. Jouzel, who is also the president of the French polar program, has participated in drilling projects at Dome C and Vostok. He says: "Compared to Vostok, the ice flow at Dome C is minimal because we're on top of a dome; thus the measurements performed on the ice cores are much more precise. We obtained the most precise profile of the carbon dioxide concentration during the last deglaciation, which began 20,000 years ago."

During the 2002-2003 summer campaign, the EPICA team may reach the bedrock at a depth of 3,250 metres (10,660 feet). There are still 400 metres (1,300 feet) to go, but they are the most difficult, since the ice temperature increases as it gets closer to bedrock, due to diffusion of the geothermal heat. In such conditions, the risk of the drilling device becoming stuck in the hole due to watery ice chips is extremely high. A team of technicians from the Laboratoire de Glaciologie et de Géophisique de l'Environnement in Grenoble has designed a new head for the EPICA drilling device. Designed to avoid ice-chip accumulation and keep the ice cool during drilling, it has been tested in ice at -2°C (in the lab). Says the chief driller at Dome C, Laurent Augustin: "If we could drill 200 metres this year it will be a success."

Frenchman Jean-Louis Duraffourg, a veteran of Antarctica and the subantarctic (9 winter-overs!), runs the Dome C restaurant, known as "Chez Jean-Louis." Some say it's the best on the icy continent. The menu includes escargots seasoned with garlic butter, beef tournedos, brochettes de coquilles Saint-Jacques, fillets of Kangaroo, fried frog legs, and of course many different pastas and risottos. Pizza is served once a week. Duraffourg takes care of every guest at his table, even if it is not always an easy task: "Two people are vegetarians, one is Muslim and doesn't eat pork, another doesn't like garlic," he says. "The French ask for some dishes that Italians don't necessarily appreciate...I prepare special recipes for everybody," he continues with a smile, while extracting a bunch of freshly-baked baguettes from the oven. The warm, reassuring perfume of fresh bread fills the kitchen and the whole main building.

Outside, the sun shines brightly, and the sky is deep blue, the temperature -40°C. From the top of the power plant, a thin plume of white smoke escapes in the wind horizontally, like the plume of steam from a locomotive photographed by O. Winston Link. Late at night, when the sun is very low, this steam plume draws magical, shadowy trails on the snow. While slowly walking toward the Concordia building site, 400 meters from the camp, I tell myself that I really cherish this place at the end of the world.

On the building site I meet Jean-Paul Fave, manager of technical operations, and Serge

Drapeau, manager of the building team, which is comprised of ten workers, half of them Italians, half of them French.

The completed Concordia station will consist of two elevated, cylindrical buildings, each with 36 faces and three floors. The two buildings will be connected by an enclosed walkway about 10 metres (33 feet) long, with a total living space of 1,500 sq. meters (16,150 sq. feet). *(See Editor's note at end.)* The two buildings will provide a clear separation of the "noisy" activities (including kitchen, dining room, storage room and technical rooms) from the "quiet" building where the labs, bedrooms, library, hospital and gymnasium will be located.

Like the new South Pole station, the Dome C towers can be raised to avoid snowdrift accumulation. Fave explains that the first raising operation will be performed in 10 years, using hydraulic jacks located in the pillars at the first floor. Back in 1996, a miniature model of the Concordia station was tested in a water-tunnel filled with sand to simulate the accumulation of snow.

Concordia's galvanized steel frame was designed and built in France. One of the towers was erected in 1994 for a test, and three experts from the U.S., U.K. and Germany were invited for inspection. The building of Concordia at Dome C then started during the 1998-1999 field season with the construction of a special platform of compressed snow, 140 metres (460 feet) long, 55 metres (180 feet) wide and 1.2 metres (four feet) high, acting as a platform of concrete. This snow platform, explains Drapeau, has a density of 600 kilograms per cubic metre (1000 pounds per cubic yard), compared to 125 kg/cubic meter (212 pounds per cubic yard) of uncompressed snow, limiting vibration and the sinking of the building in the snow. In fact, Concordia stands directly on the snow, thanks to 12 large hexagonal pads weighing five tons each. (People call them "camemberts" because of the shape!)

During the 2000-2001 field season, the galvanized steel frame was entirely assembled. In January 2002, despite bad weather conditions, all floors were completed, and one building was sealed with external panels. This external envelope is water-, air- and fire-proof. There are 101 panels for each building, says Drapeau, with 36 on the sides, 49 on the roof and 26 on the bottom. Each panel is 16 centimetres (six inches) thick and made of polyurethane foam sandwiched between polyester sheets. The panels are lifted by a crane from snow level and mounted on the galvanized steel frame. "On windy days," Drapeau says, "these operations are very dangerous: we had to stop more than once for safety reasons." The second building is due to be completed during the 2002-2003 field season.

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Dome concordia architect Jean-Paul Fave and his son examine construction plans for the newest Antarctic station.

> *Like their counterparts at South Pole station, the Concordians will be "alone on the Ice" from mid-February until mid-November, with virtually no possibility of being rescued.*

Concordia station was designed to host an international team of 16 people: nine scientists, five technicians, a cook and a physician. Like their counterparts at South Pole station, the Concordians will be "alone on the Ice" from mid-February until mid-November, with virtually no possibility of being rescued. Astronauts could almost return to Earth more easily than winter-over party members could return from Antarctica!

During the long austral night at Dome C, the temperature will drop to -80° Celsius (-110° F). But the sky, as clear as nowhere else on Earth, will glow with millions of stars. Dome C is outside of the auroral area, so there will be no "southern lights," but during full moon "days," the polar plateau outside the station will be lit like a silvery, magnificent and unknown faraway planet. Thousands of kilometers away from the rest of our crazy world, Dome C residents will have the rare privilege of admiring this scenery of silence and beauty from their room.... with a view of the Ice. ❑

© Lucia Simon

The "Raid" is a special convoy of Caterpillar trucks adapted to polar conditions and equipped with GPS navigation systems.

Editor's Note: The U.S.'s new elevated Amundsen-Scott South Pole Station, by comparison, will be approximately 60,000 sq. feet (5,575 sq. metres) and will accommodate 150 people when it is completed in 2006.

Whales—Saved?

by Cliff Bekkedahl, Editor, Polar Times

In pages to come the reader will find in the "60-40-20 Years Ago" article that the significant event featured in *The Polar Times* in 1982 was the controversial international agreement to ban commercial whaling. After ten years of debate and negotiation, 25 countries voted in favor; seven—including Japan and Norway—voted against, and five nations abstained. The impetus for this ban, which would become fully effective in 1986, was the recognized decline in whale stocks of most species, with some verging on extinction. Japan and Norway chafed at these restrictions and, over the past twenty years, have found ways to either defy or finesse opposition to their annual, albeit modest, violations of the Agreement. For example, the Japanese have been killing primarily minke whales in numbers exceeding three hundred per year, ostensibly for scientific purposes. This has been generally viewed as a shallow pretext, especially when the carcasses appear at the Tokyo Fish Market almost as soon as the whaling ship makes port. Norwegians consume whale meat and blubber but, up until recently, have not exported any of their catch. Obviously the whaling fleets of all nations and jobs associated have diminished or disappeared since the ban was implemented.

The International Whaling Commission meets annually and reports on such matters as the status of whale populations and the health and well-being of the species, and to fend off initiatives by opponents of the ban to relax restrictions on commercial whaling. As to be expected, lobbying organizations—pro and con whaling—struggle to gain the upper hand influencing the IWC. Their play is conducted in the public press, in cognizant government agencies and recently on the Internet (run a search on "whales" or "whaling" and stand back for a flood of rhetoric!)

The Japanese and Norwegians make the assertion, with some grounds, that the IWC has been "hi-jacked" by the conservation groups and has lost its mooring points by its one-sided decisions, obfuscation of data and failure to recognize population recovery in certain species that would permit commercial hunting. Conservationists deny such claims, asserting that there is no data to support claims of "recovery" of any specie that would justify restoration of whaling. Instead, they advance the notion that whale watching is the economic alternative to slaughtering these magnificent animals.

In May of this year, with Japan as the host, the IWC held its annual meeting in Shimoneseki, Japan (the sole remaining whaling port in Japan). The Japanese, as hosts, felt this was going to be their year of redemption. Alas and alack, the Commission, despite street demonstrations, stormy debate and recrimination, rejected moves to relax the ban and, moreover, dealt the host a smack on the nose by denying Japanese coastal fisherman a subsistence catch of fifty minke. The Japanese in return engineered a rejection of a U.S. request for a handful of kills for Alaskan Inuits. This mini-squabble was ultimately patched up, but clearly the goals of the Japanese and Norwegians were thwarted. By June, the meeting and its results disappeared off the current events radar scope and, except for mutterings by the Norwegians about increasing their annual take of minkes, the subject was a dead issue until next year.

What brings the topic to these pages was a curious op-ed article in *The New York Times* dated 20 August 2002 by Nicholas Kristoff (a regular columnist for the *Times*) entitled "Harvest The Whales" (reprinted herein in *toto*). By no stretch is Mr. Kristoff a science or nature writer; rather, he is a political pundit of some stature. Even so, he bravely and forthrightly jumps into the contest and contends that some whale species have, indeed, recovered in population and are sufficient in numbers to justify commercial harvesting. Reaction to his article in the *Times*, "Letters to the Editor" section, in the days following was swift and predictable. The notion of any recovery was denied; he was castigated for lack of compassion for these magnificent beasts; and his failure to have the proper facts, yadda, yadda. What spun him off on this tangent is hard to imagine, but as a matter of possible interest to our readers, *The Polar Times* has made some modest inquiries on the subject of whaling and whale stocks and has assembled the following current articles and commentary. You decide. ❑

Whale Population Estimates

Because of the considerable scientific uncertainty over the numbers of whales of different species and in different geographical stocks, the International Whaling Commission decided in 1989 that it would be better not to give whale population figures except for those species/stocks which have been assessed in detail and for which there is statistical certainty with respect to the numbers. At present, the Commission is prepared to give the following figures for best estimates of the present abundance of the following whales (rounded to the third significant figure of the upper confidence limit).

Population	Year(s) to which estimate applies	Approximate point estimate	Approximate 95% confidence limits
MINKE WHALES			
Southern Hemisphere	1982/83 - 1988/89	761,000	510,000 - 1,140,000
	Current	Under revision	The Commission is unable to to provide reliable estimates at the present time. A major review is underway by the Scientific Committee.
North Atlantic (excluding Canadian East Coast)	1987-95	Approx.149,000	120,000 - 182,000
North West Pacific and Okhotsk Sea	1989-90	25,000	12,800 - 48,600
BLUE WHALES			
Southern Hemisphere	1980-2000	400-1,400	CV=0.4
FIN WHALES			
North Atlantic	1969-89	47,300	27,700 - 82,000
GRAY WHALES			
Eastern North Pacific*	1997/98	26,300	21,900 - 32,400
Western North Pacific	Current	less than 100	n/a
**Assuming a constant rate of increase, the population was increasing at a rate of 3.2% (95% confidence interval 2.4% - 4.3%) over the period 1967/68 - 1987/88 with an average annual catch of 174 whales.*			
BOWHEAD WHALES			
Bering-Chukchi-Beaufort Seas stock	1993	8,000	6,900 - 9,200
The net rate of increase of this population from 1978 to 1993 has been estimated as 3.2% per year (95% confidence interval			

Harvest The Whales

***The New York Times,* HARWICHPORT, Mass., 20 Aug 2002, by Nicholas D. Kristof—** Whale-watching trips off Massachusetts are said to have begun only in 1975, with a pod of elementary school kids taking a boat from Provincetown, but now whale-watching is a $100 million industry in New England. And it's easy to see why: 35-foot humpbacks roll and splash so playfully around the boats that you just want to reach out and hug one.

Whales are so beloved that the authorities spent four months and $250,000 unsuccessfully trying to free a right whale dubbed Churchill from fishing ropes last year, and the stranding of 55 pilot whales near here a few weeks ago prompted a lump in the national throat. The "Save the Whales" ethos is almost unquestioned, and Norwegians and Japanese risk becoming pariahs by continuing to salivate when they see a nice juicy whale.

But it's time to put sentiment aside. The "save the whales" campaign against all commercial whaling was necessary a few decades ago, after whaling had devastated all large species. Even today, there are fewer than 10,000 blue whales worldwide, compared with 200,000 before they were hunted, and right whales may become extinct.

But it is equally true that restrictions on whaling, including a moratorium on all commercial whaling since 1986, have led to a sharp rebound in some whale stocks. The U.S. National Marine Fisheries Service estimated in 2000 that there are more than two million sperm whales worldwide. The International Whaling Commission calculated years ago that there were more than 900,000 minke whales and 780,000 pilot whales worldwide, and the numbers are higher now. Milton Freeman, a whaling expert at the University of Alberta, estimates that the number of minke whales has trebled over 30 years and that humpbacks are exploding at a rate of 12 to 17 percent annually.

Indeed, the number of gray whales (which came off the endangered species list in 1994) surged so much in the late 1990s that hundreds of dead ones began washing up on West Coast beaches, so emaciated that their ribs showed. The best guess is that the numbers of grays grew, the food supply shrank, and Malthus had his way.

The bottom line is that while most large whales remain at risk, for some species we can no longer argue that we need to "save the whales." They've been saved.

At a time when there's talk about over-fishing, it's also worth pointing out that whales now eat at least 300 million tons of marine life, three times as much as humans. There is speculation that rising numbers of minke whales may be holding down the population of blue whales that compete for similar food.

Bruce Mate is a whale specialist at Oregon State University whom I met 23 years ago on a beach where 41 sperm whales had stranded—a devastating scene as the whales thrashed on the sand and watched through sad eyes while a crowd of humans gathered to discuss what to do with them. Dr. Mate, who may know more about the blue whale than any non-cetacean, urges bold new initiatives to protect blues and other whales that are threatened.

But he also says that most biologists would not worry about commercial whaling of minkes and perhaps other populous species so long as quotas were set at a level that would sustain populations.

"Stocks that are in good health condition could have a sustainable commercial take," Dr. Mate said. "Whether you want to do it is a personal moral or ethical matter."

That is the nub of it. There is no longer a "save the whales" imperative for a moratorium on commercial whaling of all species. The only remaining argument to oppose commercial hunting of common species like the minke and perhaps the sperm and gray is to say that whales are such magnificent creatures that no one should be allowed to kill them.

But that is dangerous ground. It is culinary imperialism for us to tell Norwegians and Japanese that because we like whales, they must not eat them. We can disapprove, just as we wince as Koreans or Chinese eat dogs, but what right do we have to forbid them from eating an animal that is not endangered but simply lovable? So are lambs and deer.

So, yes, it makes sense to save the whales that are endangered. Indeed, we should do more to help blue whales, like launching an international initiative to identify and protect their breeding grounds. But it's also time to allow some species to be harvested again. ❑

In response to a* Polar Times *query citing the above* New York Times *Kristoff article, Maris Sidenstecker, marine biologist and cofounder of Save The Whales, states the following:

To my knowledge, there is no whale recovery of any species to a substantial amount that would sustain whaling. All the large whales species remain at low numbers. The fact is that whales today are bombarded by many threats from so many sources—over-fishing, water pollution, habitat degradation, noise pollution, naval testing in waters, net entanglement, and whales being struck by boats. Beluga whales in the St. Lawrence River of Canada are dying of cancer. Orcas in the Puget sound area of Washington are dying and found to have such high levels of contaminants (PCBs) in their tissue that they are hazardous waste. Pilot whales continue to beach themselves. Despite complete protection of blue whales (the largest animal to ever live on earth and which can grow to be 100 feet long) since 1965 and other endangered whale species, the population of blues is considered to be around 10,000, down from the 19th century estimate of 200,000 blue whales. The only large whale to have made any comeback is the gray whale. Its numbers are believed to be around 20,000 today, up from a population of 5,000 grays in the 1940s. However, this population does not take into account the fact that all these whales all come from a small genetic stock that makes them less genetically diverse and more susceptible to disease. And 20,000 grays is still not a lot of animals. You have to look at all these factors impinging on whale species, and you can see that their survival is a difficult battle.

DNA testing of whale meat over the past several years by a U.S. team has found, in Japan meat markets, endangered species of whales, which are not supposed to be hunted. Then you have to consider the whaling records reported by the Japanese and Russians, which were found to have been reported on the low end—meaning they took far more whales than were reported. If anything, we have less whales, not more, in the oceans today.

Krill die-off is being impacted by the greenhouse effect and the warming of our ocean surface waters. The imbalance in our oceans of less krill and less fish has been created by mankind. Fish stocks have been depleted, pollution continues, habitat degradation by catch waste continues, and ocean temperature is warming up. This has nothing to do with more whales. Countries that want to whale use this feeble excuse as a foil to continue their whaling operations.

Whaling and whalers could make money by offering ecotourism and turning their knowledge of whales into a positive venue.

Sincerely,

Maris Sidenstecker, Marine Biologist
Co-Founder, Save The Whales

Editor's Commentary:

The preceding is echoed by spokespersons from Greenpeace and the International Wildlife Fund. Greenpeace, as to be expected, was a little more strident in its objections, while the IWF simply expressed an almost blanket rejection of any type of wildlife exploitation.

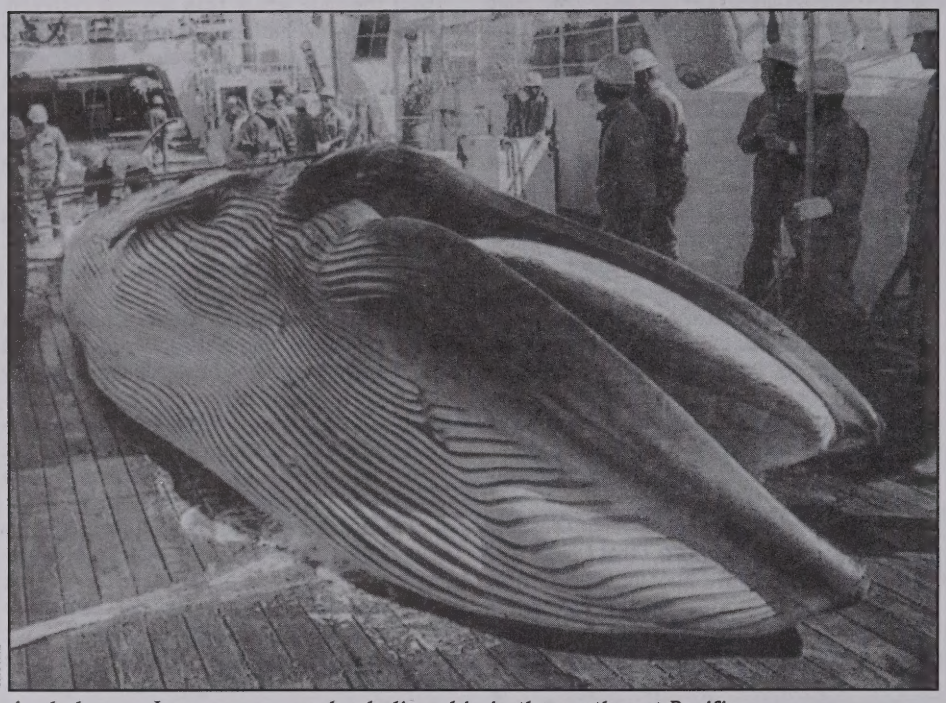
The International Whaling Commission promised a response that was not delivered in time for publication. Looking at its web site, one wonders if the organization is not somewhat disingenuous in the publication of whale population figures, emphasizing the complexities of observation, data collection and extrapolation to reach non-conclusions that, in turn, support no change or arguments delaying such decisions. Perhaps the whaling advocates have a point, vis a vis *the bias of the IWC staff and its supporting governmental bureaucracies.*

What are the economic realities of the restoration of commercial whaling? Advocates for whaling claim it is a traditional food source and, in a world of hunger, no source should be artificially constrained. Opponents say that the traditional tastes for whale meat/blubber no longer appeal to this generation and that the costs associated with whaling preclude reasonable profits without generous government subsidies.

Advocates of whaling say that whaling and the processing of whales and by-products provide much needed semi-skilled jobs. Opponents point to the $100-million-a-year industry of whale watching on the east and west coast of the U.S.

Advocates of whaling say it is necessary to thin the whale stocks to prevent further damage to the decimated fish stocks. They claim that whales consume over 300 million tons of marine life per year. Opponents question this quantity and point out that most whales subsist on plankton, krill and deep-water squid and, as such, the whales are not competing with mankind for food. ❑

Whalers and Their Foes Enlist Scientists



REUTERS

A whale on a Japanese research whaling ship in the northwest Pacific.

***New York Times*, SHIMONOSEKI, Japan, 4 June 2002, by James Brooke**—With the hunting of hundreds of whales at stake, the debate over the scientific value of Japan's whaling program boils down to dueling photograph displays of whale digestive systems.

Whale stomachs, freshly sliced open and brimming with glistening fish, were featured in glossy booklets offered by Japanese officials at the annual meeting of the International Whaling Commission here in late May. Here, they said, was proof that the world's largest animals were taking fish from the mouths of humans.

Whale feces were featured in competing information sheets. Australian and American scientists argue that DNA research on feces and skin enables scientists to learn about whales without killing them.

In this southern port, once known as "Whale City," the debate is not abstract. Japan's five-vessel whaling fleet, the last major one in the world, is based here. This year it plans to kill 700 whales: 440 minke whales in Antarctic waters and 260 [of other varieties] in the north Pacific (10 sperm whales, 50 Bryde's whales, 150 minke and 50 sei whales, a species classified as endangered by the World Conservation Union).

The whale meat is sold for food. But because the International Whaling Commission has imposed a moratorium on commercial whaling since 1986, Japan has continued whaling under a self-allocated quota for "scientific whaling." (Selling the meat, it says, is required by a commission rule that forbids wasting the byproducts of scientific research.) Norway, the only other large-scale whale-hunting nation, formally objected to the moratorium and continued with its hunt, killing about 675 last year. The United states opposes commercial whaling, allowing whaling only for traditional purposes, largely by Alaskan Natives.

"Non-lethal means for studying diets of whales simply do not provide the required data," Seiji Ohsumi, director general of the Institute of Cetacean Research, a Japanese government agency, told the conference.

Japan also argues that populations of many whale species have rebounded so rapidly in the past 15 years that they are putting fisheries at risk. "It is estimated that as much as 250 million to 440 million tons of living marine resources are consumed by cetaceans," said Tsutomu Takebe, the Japanese minister of agriculture, forestry and fisheries. "This is the equivalent of three to five times the annual harvest of marine capture fisheries in the world."

> *"Japan is not killing whales in order to do research....It is doing research in order to kill whales."*

Dr. Ohsumi says that only whale carcasses can provide "ear plugs for age determination studies; reproductive organs for examination of maturation, reproductive cycles and reproductive rates; stomachs for analysis of food consumption; and blubber thickness as a measure of condition." The number of minkes killed each year, nearly 500, "is the smallest number required to obtain statistically valid results," Dr. Ohsumi said.

But many environmentalists, diplomats and scientists at the conference questioned the value of Japan's research.

"Japan is not killing whales in order to do research," said Richard N. Mott, international policy vice president for the World Wildlife Fund. "It is doing research in order to kill whales."

In Sydney, Dr. Nick Gales, principal research scientist with the Antarctic division of Australia's Environment Department, has said that feces, easily collected with nets, can be analyzed using DNA methods to identify what whales eat, the parasites they carry, their sex and other characteristics.

Other scientists use non-lethal darts to take skin core biopsies, said Dr. Phillip J. Clapham, a whale biologist at the Northeast Fisheries Science Center in Woods Hole, Mass., who estimated that 3,500 research darts had been fired into humpback whales in the North Atlantic over the last decade.

Fired from crossbows or rifles, these darts burrow about an inch into a whale's skin, then pop out and float in the water. Very few are lost or get stuck in whales, Dr. Clapham said. DNA analysis of the skin samples allows identification of the whales. In one case, he said, a whale identified by a skin dart off northern Norway was identified several years later in the Caribbean.

Noting that the Japanese Antarctic whaling program had published just half a dozen papers in international journals over the last decade, he said, "This is a terrible record for a huge program that has been operating for years and killing thousands of animals for research."

The Japanese assertion that rising whale populations endanger global fish stocks is also bitterly controversial. Mr. Takebe, the agriculture minister, approvingly noted that "competition between whales and fisheries" is to be studied by the fisheries committee of the United Nations Food and Agriculture Organization, though he did not mention that the panel's head is a colleague, Masayuki Komatsu, Japan's deputy delegate to the International Whaling Commission.

Environmentalists say that there are no reliable censuses of whales.

The food and Agriculture Organization says worldwide hauls of fish have increased since the whaling moratorium began, to 90 million tons a year in the 1990s from 75 million tons in the 1980s. Japanese officials retort that Japan's catch has dropped in half since 1988, registering only 6.5 million tons in 2000.

In this port town, that argument is highly visible. City buses are painted with bloated whales and the slogan, "The whale is threatening the fisheries industry." T-shirts show three fishermen despairing over their catch of one lone fish, while four sated whales swim offshore.

"Do you know how many fish the whales are

(CONTINUED NEXT PAGE)

Yuk! No More Stomach for Whales

***Shimonoseki Journal,* SHIMONOSEKI, Japan, 24 May 2002, by James Brooke**—In April, two of Japan's last whaling ships steamed into the harbor here, fresh from their latest "scientific" whale-hunting trip to Antarctica. To promote whaling, the ships were opened for tours by reporters and junior high school students. After touring freezers and hefting 90-pound explosive harpoons, one group of teenagers was asked by a Kyodo News Agency reporter if anyone had ever eaten whale meat. No hands went up.

Japan, home to the world's largest remaining whale hunt, is losing the younger generation.

In a poll in April for the newspaper *Asahi Shimbun*, the percentage of respondents who said they did not eat whale meat-ranged from 32 percent of those over age 60 to 53 percent of those aged 20 to 24. Of the 2,060 total respondents, those who said they actually ate whale meat "sometimes" amounted to just 4 percent.

Among people in their 20s, almost 60 percent opposed a resumption of commercial whaling, though resumption is a cause dear to the hearts of Japanese officials.

"Ultimately, whaling's demise may have little to do with how majestic, smart or endangered the mammals are, but simple economics," *Asahi Shimbun* wrote last month. "A growing number of Japanese don't want to eat whale meat. And if they won't eat it, they won't buy it, and if they won't buy it, say goodbye to Japanese whaling."

Immediately after World War II, when famine threatened Japan, whale meat accounted for nearly half of the meat consumed nationwide. Through the early 1960s, it stayed as high as 30 percent, remaining a staple for school lunches. But today it has dwindled to a tiny fraction of 1 percent.

> *"Today, the average Japanese consumes almost no whale meat at all."*

"Today the average Japanese consumes almost no whale meat at all," complained *The International Harpoon*, a pro-whaling publication circulated in late May at the annual meeting here of the International Whaling Commission, which tries to regulate whale hunting.

Last year, for the first time in memory, the Institute for Cetacean Research—the agency that oversees whaling in Japan—failed to sell its stock of whale meat. With 30 percent of the 725-ton harvest going unsold, the agency has cut 10 to 20 percent off the average wholesale price of $11 a pound. Since the government subsidizes the whaling expeditions to Antarctica and the Northern Pacific, this price cut means a bigger government subsidy.

In essence, the government uses taxpayer money to persuade taxpayers to eat whales hunted with taxpayer money. To cut prices further, the government's Fisheries Agency hopes to start importing whale meat later this year from stockpiles in Norway, the other major whaling nation.

This international notoriety has had much to do with reducing Japan's once-robust whaling industry to a dying enterprise maintained by government subsidies. But there have been other causes too: The domestic association of whale meat with low-grade school lunch food; prices levels associated with gourmet food; and the uneconomical nature of long whaling voyages to Antarctica.

Attacking what may be whale meat's last stand in Japan, three environmental groups—Greenpeace, Safety First and the Environmental Investigation Agency—issued reports at the conference here saying that whale meat is unsafe because of concentrations in blubber of polychlorinated biphenyls, or PCBs, which are believed to cause cancer. The campaign could have a strong impact in Japan. ❑

Whalers and Foes . . .

(CONTINUED FROM BOTTOM LEFT)

eating?" Hiromi Ichimura, a fisherman, asked an American visitor at a whale restaurant here. "We have to cull the whales to keep the balance of nature."

But many scientists and diplomats from other nations say there is no reliable calculation of whales' total food consumption. In contrast to the image of whales vacuuming the world's commercial fish stocks, most whales live largely off krill, plankton, tiny crustaceans and deep-sea squid. Ocean ecosystems, these scientists say, are too complex to conclude that fewer whales will result in bigger commercial catches.

"There is no scientific evidence that finds whales are causing the decline of fish stocks in our oceans," said Rolland A. Schmitten, a National marine Fisheries Service official, who was the United States' representative to the meeting here. Speaking at a news conference, he said, "Declining fish populations are due to people, not whales."

THE INSTITUTE OF CETACEAN RESEARCH

Pacific saury in the stomach of a minke whale. The Japanese contend that whales threaten fishing.

Estimating that world whale populations may have declined by 80 percent over the last century, Mr. Mott, of the World Wildlife Fund, said, "whales are eating fewer fish in the oceans than at any time in human history. And humans are eating more."

With the blue whale population in Antarctica down to 300 today, from 125,000 a century ago, many representatives from anti-whaling countries say they distrust any whaling operation. The distrust was heightened by a recent book by Isao Kondo, a 75-year-old retired whaling company executive, who wrote that from 1965 to 1978, his company's ships caught two to three times as many sperm whales as they reported to the government and the International Whaling Commission.

Separately, Russian researchers analyzing Soviet records from 1948 to 1973 have concluded that the reported tally of 2,710 humpbacks taken in Antarctic waters was only 5 percent of the actual number.

Many countries are now arguing, over Japanese objections, for the establishment of whale sanctuaries in which all whaling will be banned. On may 24, the last day of the conference, Mexico agreed to set up what it called the world's largest national sanctuary for whales: a total of 1.15 million square miles of Mexican coastal waters in the Atlantic and the Pacific.

"We have a big whale watching industry in Baja," said Andrés Rozental, Mexico's representative here. He urged other nations to band together, creating regional whale sanctuaries, patrolled by coast guards.

This movement is catching on in Japan, where 100,000 people every summer now go whale watching, feeding a growing skepticism about whale hunting. Mark Brazil, a science writer, wrote recently in *The Japan Times*, a newspaper, "With the development of so many nonmetal research techniques—whether DNA sampling, satellite tracking, telemetric tagging or analysis of feces to determine diet—the government's support for killing whales even for 'research' seems as odd as killing giant pandas, Siberian tigers or Japanese cranes." ❑

Japan Rebuffed in Fight to Ease Ban on Whaling

***The Washington Post*, SHIMONOSEKI, Japan, 23 May 2002, by Doug Struck**—Huge tenders once slipped into port here, heavy with the frozen carcasses of whales—blood-red slabs of meat brought from the city's 40 whaling boats that prowled the far Antarctic Ocean.

The city yearns for those days, only four decades ago. But today at its new convention center—past the shrubbery cut into the shape of a smiling whale—Japan's delegates are once again losing their battle in the International Whaling Commission to restore the commercial hunt of great whales.

Their futile effort at the commission has become an annual rite, much like the departure of the only two whaling boats left in Shimonoseki, which set off each fall to hunt whales in the name of research.

But this year's meeting of the IWC, which imposed a ban on whaling in 1986, was supposed to be different. This year, with the commission meeting on Japan's home turf in what was once known as Whale City, Japan had hoped to finally gain enough allies to put antiwhaling nations in the minority and begin a march toward eventual reversal of the ban. Instead, Japan has lost key votes, and the annual meeting of 48 nations has turned into its usual parliamentary brawl. Iceland stormed out, accusing the United States of dirty tricks, while Japan lashed out with uncharacteristic rhetoric against the U.S. "double standard." And several small countries were left sputtering denials that their votes were bought by Japanese foreign aid.

"Japan thought they were going to be doing a victory lap this time," said a whaling opponent. "They can't be happy."

The commission meetings run through Friday, but the succession of votes already guarantees that one of the most passionate international environmental disputes will remain deadlocked.

The balance is close enough that Japan and its allies succeeded this morning in stinging the United States. The prowhaling nations blocked a five-year extension that would have allowed Inuit and other native peoples in Alaska and Russia to take 56 bowhead whales each year for subsistence. The vote stunned U.S. delegates who claimed Japan reneged on private promises, and they scrambled in hopes of reversing the decision.

Japan and Norway want to ease the commercial whaling ban, arguing that some whale species have recovered enough to hunt. Antiwhaling countries, led by Europe and the United States, say whales still need protection from hunters who brought the near-extinction of some species before the whaling ban was approved.

"There's not much middle ground," acknowledged Rolland Schmitten, head of the U.S. delegation.

Emotion fuels both sides. For those who oppose whaling, Japan's "research whaling"—a loophole in the ban that last year allowed Japan to kill 600 whales—is a red flag. It's not legitimate research, argues Vassili Papastavrou, a marine biologist for the International Fund for Animal Welfare. "It's 101 things to do with a dead whale."

For Japan, the battle has become one of national pride.

"We just don't understand," said Nobuaki Kawamoto, 46, who runs Shimonoseki's fish market, a wet warren of holding tanks for fresh catch and stalls that sell anything from whale to the city's other signature product, the poisonous fugu, or tiger blowfish. "My generation grew up eating whale. But the next generation won't, and Japan's culture will be diminished by it."

The fight has become a parliamentary chess game. Japan cannot produce the three-fourths vote of the commission to overturn the ban, but instead has concentrated on trying to build a majority to win significant rule changes. That strategy stumbled when the IWC on Monday rejected a bid by Iceland, a whaling nation that left the commission 10 years ago, to rejoin while still rejecting the whaling ban, prompting Iceland to declare its "disgust."

Japan had recruited developing countries such as Monoglia, Palau, Cape Verde and Gabon to join the commission, leading to charges it was buying their votes with foreign aid. But their entry was offset by new votes from San Marino, Peru and Portugal, which took the other side.

The end tally left Japan short in its bid to make voting secret and to end whaling sanctuaries in the Indian and southern oceans. In turn, the antiwhaling bloc failed to win new sanctuaries in the southern Pacific and southern Atlantic oceans.

Despite the recriminations inside the meeting, the battle outside has been surprisingly civil. Kiyoshi Ejima, mayor of Shimonoseki, recalled his shock at attending an IWC meeting in Australia two years ago and seeing antiwhaling protesters calling Japanese "murderers" and carrying the rising sun flag dripping with fake blood. He didn't want that, he said. "We just wanted both sides to understand the whaling culture," said Ejima, who impressed activists with his open approach.

"We are not tying to bring the past whaling back," Ejima said. "But we want to have enough whaling here to pass down to the next generation the Japanese traditions,"

Shimonoseki is perched at the western tip of Japan's main Honshu island. In 1899, when Japan embraced the "Norway method" of modern whaling with steam-fired harpoons, the city quickly found itself at the heart of a new industry.

By mid-century, its shipyards were producing the big steel-hulled whaleboats that ranged farther and farther for their catch and kept Shimonoseki's docks hectic with the haul.

But even before the whaling ban, a decline for Shimonoseki had begun. Whalers and fishing boats began taking their catch to more modern ports. A tunnel in 1958 and a bridge in 1973 broached the narrow strait to the next big island, Kyushu, and suddenly Shimonoseki became a place to pass through rather than stop.

The 1986 whaling ban capped that trend. Shimonoseki remains a city of 250,000, with a smattering of whale restaurants and red whale meat still sold in the local supermarket—proceeds of the "research" hunt.

"We taste nostalgia in the whale meat—the tongue remembers. If that is a bygone era, it is sad," said Kawamoto at the fish market." ❑

Man Dies After Whale Jumps Into Boat

***Associated Press*, PORT SAN LUIS, Calif.**—A whale suddenly breached and crashed into the bow of a fishing boat, killing a restaurant owner on board.

Jerry Tibbs, 51, owner of Mr. Tibb's Ribs in Bakersfield, was aboard his boat, *The BBQ*, on Sunday when the whale hit and tossed him into the sea five miles off Port San Luis. Three other fishermen stayed aboard the damaged boat, which was towed to shore by the Coast guard.

Tibbs and his three friends were just ending a day of fishing for albacore when the accident occurred.

After more than 18 hours of searching, Tibbs' body was found Monday afternoon.

Coast Guard officials said it was the first time they could recall an accident caused by a whale hitting a boat. ❑

Whale Recovery

***Earth Environment Service*, 30 Sept 2002**—The first northern right whale calf to be seen in the eastern North Pacific Ocean for perhaps a century was reported by the U.S. National Marine Fisheries Service. "The North Pacific right whale population is in danger of extinction. A mother and calf embody hope for the whales," said Jim Balsiger, regional administration for the service in Alaska. The northern right whale is the most endangered whale in the world. It was hunted extensively in the early 1900s because it was easy to catch and floated after being killed. Between 1900 and 1994, there were only 29 reliable sightings of right whales in the eastern North Pacific. ❑

Iceland Joins Whale Panel, Giving Whalers Stronger Say

***The New York Times,* OSLO, 20 Oct 02, by Walter Gibbs** - For two decades, antiwhaling nations led by the United States have safeguarded the International Whaling Commission's moratorium on commercial whale hunting. But a vote last week allowing Iceland to join the commission showed a shift in power toward the defiant whaling nations.

Iceland, a former whaling nation that quit the commission in 1992, was readmitted at a quarrelsome meeting in Cambridge, England, despite its declared intent to resume commercial whaling in 2006. For now, only Norway conducts an annual commercial hunt—in defiance of the commission majorit—although Japan takes hundreds of whales each year for what it says is scientific research.

The vote to readmit Iceland was 19 to 18, with a host of tiny nations with little or no direct interest in whaling falling in behind Norway and Japan. A last-minute procedural challenge by Antigua and Barbuda, a staunch Japanese ally, so confused the Swedish delegation that it mistakenly supported Iceland's membership instead of blocking it.

"We were not prepared in substance to accept Iceland as a member, but it happened anyway," said Carl Erik Ehrenkrona of the Swedish Foreign Ministry.

He said on Friday that Swedish officials were still examining the arcane series of resolutions that misled them, but he acknowledged that Iceland's membership, rejected twice before, appeared secure. The commission's executive director, Nicola Grandy, said the vote, taken last Monday, would stand.

Although Iceland became the commission's 49th member by mistake, there was already a rush to membership by nations professing sympathy with Japan and Norway. In principle, membership is open to any country that agrees to abide by the rules, and seven nations have joined this year alone. At least five—Benin, Gabon, Mongolia, Palau and Iceland—appear solidly in the whalers' camp.

> *Iceland, a former whaling nation ... was readmitted at a quarrelsome meeting in Cambridge ...*

According to Greenpeace International, the environmental group, the surge in pro-whaling sentiment is a result of promises by Japan to give aid to countries that support its quest to legitimize whaling.

Whalers say their allies are simply attuned to the need to exploit all food resources. They note that a similar spike in membership—including the admission of landlocked Switzerland and Austria—transformed the commission into the 1980s from a body that regulated the whaling industry to a body that now prohibits all whaling on principle.

By all accounts, the antiwhaling forces retain a slight majority on basic issues. That is more than enough to keep the moratorium in force, because a three-fourths majority is required to rescind it. But on resolutions requiring a simple majority, the pro-whaling alliance has become a force to be reckoned with.

"You can do a lot with a simple majority," said Rune Frovik, spokesman for the High North Alliance, a whalers' association in Norway. "For many years, the commission has passed what we call hate resolutions calling on Norway and Japan to stop whaling. Soon they might not be able to pass those resolutions." More substantive are the commission's frequent majority-vote resolutions urging member states in the Convention on International Trade in Endangered Species to continue listing the minke whale—the favorite target of Norwegian and Japanese whalers—as an endangered species.

In any case, the new Icelandic commissioner, Stefan Asmundsson, said that Iceland's whalers would not restrict themselves to the minke. He said they would also hunt giant fin whales, as they did for decades until 1989.

Mr. Asmundsson said Iceland also retained the right to start "scientific" whaling, a practice condemned by some environmentalists as a cover for commercial activity.

"Obviously we'll have to freshen up our equipment somewhat," he said, acknowledging the advances in harpoon technology since Iceland last had a whale hunt. ❑

Japan's Try to Up Whale Hunt Stalled

***Associated Press,* SANTIAGO, Chile, by Graham Gori**—A proposal to legalize hunting for two endangered whale species was defeated at a U.N. convention Friday, frustrating Japan but encouraging conservationists.

Japan presented proposals at the U.N. Convention of International Trade in Endangered Species to remove Bryde and Minke whales from the endangered list and allow hunting.

While other whaling nations such as Norway and Iceland supported the proposal, Japan fell shy of the two-thirds majority from the 160 nations present at the meeting.

Conservation groups celebrated the defeat over what they see as Japan's attempts to rekindle international whaling, which was banned in 1986 when many species faced extinction.

Today Japan sells the meat from around 700 whales it kills every year under a scientific permit. Given the scarcity, whale meat has become a delicacy. Hunting proponents maintain that there are enough Minke and Byrne whales to sustain managed harvests.

"Japan simply doesn't want to have their culture put down by the so-called higher moral Western nations," said Alan McNow, a consultant for the Japanese Whaling Association.

"In Japan's case, whaling is certainly cultural, but it is not done for subsistence," said Kitty Block, an international legal council to the U.S. Humane Society. "They are looking to open up commercial whaling."

Japan's delegation said it has three more years to reconsider its strategy and decide whether to present new proposals at the next convention. Summit officials said Japan can still re-offer its proposal next week.

"It's an extremely sad day, because the delegates haven't recognized that cultural diversity is just as important as biological diversity," said Glenn Hema, a member of Japan's delegation. "Japan doesn't tell other cultures what to do with their beef." ❑

Norway Resumes Whale Exports

OSLO, 20 July 2002—Norway has defied a global ban and exported whale meat this week for the first time in 14 years, Norwegian whalers said yesterday.

Oslo said world opinion would not curb its independence. Greenpeace activists accused the government of "arrogance."

Norway refuses to sign on to the trading ban, along with Japan and Iceland, but had not sold whale meat or blubber since 1988 until a small shipment arrived in Iceland in midweek.

"It feels good to get started. Even though it's not a huge quantum, it's a step in the right direction," said Ole Mindor Myklebust of the export firm Myklebust trading.

Concerns for the survival of the world's biggest mammals persuaded most fishing nations to ban commercial whaling in 1986.

Norway, with a long history of whaling, resumed commercial hunting of minke whales in 1993, arguing their numbers are up from extinction levels and they are in fact damaging fish stocks. ❑

Due South

By Jeff Rubin, Antarctic Editor

As you read this, our "Due South" editor, Jeff Rubin, is due south serving as a lecturer on a cruise ship plying the islands off Antarctica.

I'll not attempt to match his reportorial skills or knowledge of things South; rather, I will say with certainty that Antarctic science and construction continue apace and that since our last issue, no large events attract our attention.

Jeff found the author of the lead article, "Dome Concordia," and arranged for its publication in our pages. By summer of 2003 we should be bringing you an update on construction of the new South Pole facility which at this time—our U.S. winter—should be proceeding full bore.

On a subject bi-polar, Jeff urged inclusion in this issue the article written by Robin Michaels, the "Student On Ice" (see article on page 14). Robin clearly experienced the awe and wonder we all felt when Antarctica first entered our lives, an experience few ever forget.

I commend the Students On Ice program to the attention of our members. It's a Canadian-based program, international in scope, which presents young students, ages 16-18, an opportunity to spend their holiday break in Antarctica or a few summer weeks in Arctic areas. It's a genuine learning experience, with recognized Polar scientists serving as teachers and engaging the students in experiments and observation protocols.

More attention needs to be paid to engaging young people in Polar studies and our country's activities North and South, something wherein the APS might well have a role to play.—***Cliff Bekkedahl*** ❑

DON'T FORGET

to vote for the

BOARD of DIRECTORS!

(see insert)

Antarctic Notes

France Repeals Tourist Visit and Anchorage Taxes

The French government has repealed two legislative decrees that required vessels conducting tourist and adventure activities in Adelie Land to pay an anchorage fee and a per-person visitor tax. The fees, which are believed to have been the first of their kind levied on the Antarctic continent, caused concerns for an Australian tour company, Ocean Frontiers, which visited the French station at Dumont d'Urville earlier this year.

France detailed its decision in information paper 9 at last month's Antarctic treaty consultative Meeting in Warsaw, Poland. The paper says that France had "intended to invite all States who have permanent scientific bases in Antarctic to do the same," but that after consultation with other Treaty nations it was realized it would not be able to obtain consensus on such a move. The decrees were subsequently withdrawn, effective 1 July 2002.

According to the ATCM paper, the taxes were introduced as a measure to "slow down the expansion of tourism" around France's Dumont d'Urville station on the coast of Adelie Land. The initiative stemmed from a policy that was aimed "at protecting the Antarctic environment" as it has been "increasingly threatened by the development [of tourism] in recent years." Funds generated by the tax revenue were to be used to "repair [any damage caused] to the Antarctic environment" by tourism.

Few tourist ships have visited Dumont d'Urville over the past decade, the station being off the routes normally plied by such vessels. No more than 500 tourists are to have visited Dumont in the period since 1995.

Proposed Trans-Antarctic Pole-to-Pole Flight 'Postponed'

U.S.-based Concorde Spirit Tours (CST) has postponed its proposed flight by a wide-bodied jet across Antarctica early next year as part of an attempt to set a new record time for an around-the-world journey via both geographic poles. CST originally scheduled the flight for November last year, but the company cancelled it soon after the September terrorist attacks, before rescheduling it last July for mid-January 2003.

CST President Don Pevsner gave "a probable U.S./Iraq war" as the reason for the deferral of the rescheduled flight. He said that he was forced to make the decision, as he "cannot risk a repeat performance of September 11," when, he says, the impact on his plans was significant.

Pevsner says that his "first choice of dates" for the next attempt, which will now start and end in Miami in the southeastern U.S., is 15-17 December 2003. Those dates have been chosen so that the aircraft used could fly over the site of the Wright Brothers' first powered flight at Kitty Hawk, North Carolina, on the 100th anniversary of its occurrence. Pevsner says, however, that the "availability of a Boeing 747-400 shortly before a major holiday period remains the key issue."

U.S. Firms Increase their Share of Ship-Based Tourist Market

United States-based companies increased their share of the ship-based tourism market by 12 percent in 2001-02, carrying close to two-thirds of all tourists who traveled to the continent by sea on passenger vessels. Despite that result, which appears to have flowed partly from the demise of Canadian operator Marine Expeditions last year, the number of U.S. citizens who visited Antarctica has fallen for the third year running.

The top five companies in terms of passengers carried last season were:

- Orient Lines (U.S.) – 22 percent of the market; 1 ship; 2,893 passengers; 6 voyages
- Holland America Line (U.S.) – 15 percent of the market; 1 ship; 2,029 passengers; 2 voyages
- Hapag-Lloyd (Germany) – 13 percent of the market; 2 ships; 1,741 passengers; 14 voyages
- Quark Expeditions (U.S. – 11 percent of the market; 4 ships; 1,410 passengers; 27 voyages;
- Peregrine Expeditions (Australia) – 7 percent of the market; 1 ship; 918 passengers; 10 voyages

Of these five, all except Holland America conducted landing operations, and 56 of the 59 voyages they collectively ran were to the Antarctic Peninsula region. Orient Lines is the only non-IAATO member of that group as its ship, the *Marco Polo*, conducted landings with 515,547 and 548 passengers on three of its six voyages. Under IAATO By-Laws, IAATO members whose vessels are carrying more than 500 passengers are not permitted to make landings in Antarctica.

Record Peninsula Berth Numbers on Offer; Load Factor Key to Season's Outcome

A record number of berths are available on tourist ships scheduled to land passengers at Antarctic Peninsula locations during the 2002-03 austral summer, according to information provided to last month's Antarctic Treaty Consultative Meeting (ATCM-XXV) by the International Association of Antarctica Tour Operators (IAATO). Should average voyage load levels reach 75 percent across the fleet over the next four months, eight percentage points less than the actual figure reached in 2001-02, a new visitor record for the Peninsula region should be set.

Thirteen vessels will be operating in the Peninsula region during November; 17 in December; 18 in January; 20 in February; and 11 in March. Given current schedules, there are at least six periods of between 4 and 10 days in length, when 11 to 12 ships will be in Peninsula waters at one time. However, IAATO advised earlier this year that it had arrangements in place to deal with any potential crowding at landing sites.

However, few voyages depart with all berths filled, and the IAATO paper puts the number of probable (Peninsula landing) passengers at around 13,964. That is more than the 13,600 who landed during the record 1999-2000 seasons.

Now on Display

Now on display at the American Museum of Natural History, Central Park West and 79th Street, in New York City, "Under Antarctic Ice." The show consists of 30 large-format photographs by Norbert Wu, of all mammals, fish and plants found under the ice in Antarctica. ❑

Snotters

EDITOR'S NOTE: Due to a production error, the following section was omitted from Antarctic editor Jeff Rubin's "Train Oil and Snotters: Eating Antarctic Wild Foods" story in the last issue:

Probably the most unusual food item in the Antarctic larder was the nose (or trunk) of the male elephant seal. Early sealers apparently boiled the trunks in salt water for hours, then stuffed and roasted them. L. Harrison Matthews wrote in *Sea Elephant* (1952) about a re-creation of the dish:

'Christ Almighty!' said the cook when I dumped them flabby and bloody in the galley. 'What the hell you got there?'

It took a little persuasion to get him to agree to cook them but he gave in for a tot of rum...He scalded the skin and hair off the trunks, and then simmered them in salt and spices for many hours, dishing them up the next day. We were all a trifle suspicious of the steaming kit with the blanched and swollen trunks quivering in it; but they smelt good.

'Well,' said the skipper to me, 'it's your idea, you take first cut.'

I sliced off a chunk on to my plate and took a mouthful, the others closely watching my face.

'All right,' I said. 'Very good, like pig's trotters and tripe. Here, I'll have some more,' and I loaded up with another thick slice...

Then they all tried it and came back for more—it was really excellent and had swollen up soft like calf's head. The only thing against it was the indecent-looking nostrils gaping in every slice.

'Next time we'll try stuffing them,' I said. 'Sage and onions in one hole, thyme and lemon in the other, then you'll get a bit of both in each slice. Hansen says the old timers used to call them snotters.'

JEFF RUBIN

Elephant seal

'Well snotters is good,' said Nils.

One snotter was enough for the six of us, and the cook pickled the other two in vinegar and served them up cold the next day. If the Wine and Food Society want a new thrill they should try pickled sea-elephant snotters. — ***Next time:*** **"Penguins and Other Birds."** ❑

Anthrax Spores Found in Antarctica

Associated Press, **WELLINGTON, New Zealand, 24 July 2002**—Anthrax spores have been found in the stables of the Antarctic hut used a century ago by a British explorer, a historical organization said Wednesday.

The spores probably were carried by pack animals brought to the continent by explorer Robert Falcon Scott in 1912. They were discovered by accident during tests done in preparation for a major renovation of the site.

Government officials said the spores do not pose a danger to humans in such low concentrations, but the Scott hut at Cape Evans has been temporarily closed while tests continue.

New Zealand's Antarctic Heritage Trust requested the tests, which were done by scientists from New Zealand's Waikato University at Hamilton.

Trust executive director Nigel Watson said there was no evidence or medical record of any men on Scott's Antarctic expeditions suffering from anthrax.

"Thousands of people have passed through the historic huts since they were rediscovered in the late 1940s without any cases of confirmed anthrax," he said.

Among recent visitors to the hut was Britain's Princess Anne, chairwoman of the British Antarctic Heritage Trust, who in February launched a campaign to raise $16 million to restore the Scott hut and others on the frozen continent.

Waikato University biology professor Roberta Farrell said it was possible for the spores to be preserved for decades in the extreme cold.

Health Ministry spokesman Dr. Douglas Lush said anthrax spores may have been present in animal food taken to Antarctica to feed the Manchurian ponies and Hamalayan mules he used during his 1912 expedition. Anthrax was endemic in Asia at the time, Watson said. ❑

Sighting of Antarctic Penguins Allays Fears

Reuters, **WELLINGTON, 28 Aug 2002**—The discovery of a large rookery of Emperor penguins in Antarctica has raised hopes the birds have not been badly affected by a huge iceberg, Antarctica New Zealand said on Wednesday.

There were fears last year that a massive iceberg and a large amount of sea ice had caused huge loss of life in Emperor and Adelie penguin colonies at Cape Crozier on Ross Island.

The penguins were photographed by researchers on a United States Air Force plane returning to New Zealand from a mid-winter resupply flight to bases on the island.

"The penguins were in a big huddle ... We can now hope that the Emperors have had a successful breeding season over the winter," Antarctica New Zealand Chief Executive Lou Sanson said in a statement.

It was impossible to determine how many penguins there were, but their presence was a positive sign, he said.

Around one thousand pairs of breeding Emperors usually nest at Cape Crozier, about 50 miles northeast from New Zealand's Scott Base and the United States' McMurdo research stations. Emperor penguins are the largest penguins in the world, standing more than 3.3 feet tall and weighing up to 88 lbs. They undertake the deepest and longest dives of any bird—records stand at 1,765 feet and 22 minutes.

The birds lay only one egg and raise their chicks well inland in the height of Antarctica's winter.

Cape Crozier is also home to more than 100,000 pairs of the smaller and more common Adelie penguins, which were feared to have lost as much as a third of their populations through starvation and lack of breeding.

The appearance in the Ross Sea of a large iceberg roughly the size of the island of Jamaica, or about 4,500 square miles in area, and an increase in sea ice made it almost impossible for the birds to find food, causing the deaths of thousands of chicks.

Penguin specialists are expected to go to the region in October for a detailed count. ❑

River of Ice Reverses

It's hardly a tourist attraction on the order of, say, the famous Reversing Falls of St. John, New Brunswick, but a river of ice in Antarctica is intriguing nonetheless: Scientists have discovered that at some point in the last several centuries, it completely reversed its course.

The ice stream, known as C-0 (C-zero), is one of many that make up the West Antarctic Ice Sheet, a vast expanse of ice that moves from the interior toward the ocean. The scientists, from Caltech and the universities of Washington and Colorado, studied the stream's past and present movement using data from ice cores and ground-penetrating radar as well as satellite monitoring of sensors embedded in the ice.

The data showed that C-0, like other smaller streams, used to flow into a larger stream, known simply as C. But at some point about 250 years ago, the researchers report in the journal *Nature*, stream C slowed down and started thickening. C started acting like a dam for C-0 until, at one point, C-0 halted completely and started flowing in the opposite direction. It still flows that way.

The alternating ice stream is more than just a curiosity. The West Antarctic Ice Sheet had been retreating for thousands of years as it lost more mass through movement to the coast than it built up in the interior.

Over the last several hundred years the situation has been reversed, and the ice sheet is now growing. It matters whether this growth is temporary, for if the sheet were to start thinning again, it would have a huge effect on global sea level. Scientists hope data on the individual streams will help them understand the future of the whole sheet. ❑

'Students on Ice': Realizing My Dreams in Antarctica

Courtesy of Robin Michaels

Student Robin Michaels getting her hands on a piece of The Ice.

***The Ottawa Citizen*, 26 Jan 2001, by Robin Michaels**—Once in a lifetime you live through an experience that forever changes your world and the way you see things. If you are lucky, it will happen early enough in your life that you can share with others the experience and its effects on how you perceive the world.

> *In an exhilaratingly brutal trip down the Drake Passage, 15-metre swells smashed the sides of the boat during the worst storm of the season.*

During the Christmas holidays, I was fortunate enough to enjoy such an amazing experience, and I'm only 16 years old. On Dec. 27, I embarked on a two-week expedition that would lead me down past Buenos Aires and Cape Horn to Antarctica. I voyaged with an Ottawa-based company, Students On Ice, on the first-ever student expedition to the White Continent. My goal was to learn about our world and the environmental issues that affect us.

Before I left Ottawa, I did not know what to expect. I knew I was making history and that I would be stepping onto a continent that has been visited for only 100 years, but I did not realize just how magical it would be. Antarctica is an awe-inspiring part of the world, a land of sheer beauty—a land where wildlife has no fear because it has not learned the harm that humans cause—a land of beautiful sunsets and minke whales.

To get down to where our expedition vessel awaited was an adventure in itself. The 50 students and 30 teacher-chaperones and scientists left Toronto's Pearson airport just before noon on a cold, cloudy day. After a stopover in New York City, we headed off on the 11-hour plane ride to Buenos Aires. Next, we took an early morning flight to Ushuaia, a small city at the very tip of Argentina.

We then headed to the port where we boarded our boat, the *Marine Discovery*, a 100-metre-long, four-deck, 4,200-ton research vessel. It had a lecture room, a library, a lounge area and a top-deck observatory. Near 7 p.m., we sounded the horn three times, and headed off down the Beagle Channel.

In an exhilaratingly brutal trip down the Drake Passage, 15-metre swells smashed the sides of the boat during the worst storm of the season. Almost everyone on board was horribly sick, fleeing the morning lecture to deal with their seasickness. Others, like me, didn't even bother getting out of bed until past noon for fear of throwing up. It was a huge relief when we finally arrived at our first destination, Aitcho Island in the South Shetland Islands.

We landed at a sandy, pebbled beach. As we walked inland, the ground changed from sandy to mossy to snowy and icy. Thousands of gentoo and chinstrap penguins covered the landscape.

Stepping onto Aitcho, I was overcome by pure happiness. I had accomplished my dream, and the adventure had just begun. I still had 10 more days to go!

I knew then that the months of letter-writing to raise the $8,900 (Canadian dollars) for this trip was well worth it. I had been surprised at how my sponsors—the Ottawa-Carleton Board of Education, *Yes Magazine* (a Canadian science magazine for children), West Hill pharmacy near Scarborough and Mountain Equipment Co-op in Ottawa—were all as eager as I was for me to go on this expedition.

I spent my time on the boat attending lectures on such interesting subjects as the underwater biology of Antarctica (given by Ottawa's Kathy Conlan of the Museum of Nature), listening to music in the lounge, playing games with the other students and taking in the sights from the top-deck observatory.

By the end of the voyage, I had made many good friends and had been all over the coast of the Antarctic Peninsula, visiting such places as Neko Harbour (the most beautiful place on Earth, where I slid down a glacier and saw a young emperor penguin), Deception Island (where I pulled on my swimsuit to join 60 shipmates for a polar dip), Paradise Bay, Yalour and Gourdin islands, and walked among chinstrap, adelie and gentoo penguins.

As we prepared for the trip back to Canada, all we had to keep us going was the thought of being able to make one last landing at the Diego Ramirez Islands, in the middle of the Drake Passage. If the passage, which had made us so sick the first time, was calm enough for us to land, we would see hundreds of nesting albatross and macaroni, rock-hopper and magellanic penguins. We must have had good karma that day because we did manage to land.

One of the goals of expedition leaders Geoff Green and Angela Holmes was to get all 50 students from across Canada to sit down together to write a youth statement on how we wanted to help preserve Antarctica. The final document urged Canada to become a full member of the Antarctic Treaty, to ratify the Antarctic Treaty System's Environmental Protocol, to protect the wildlife, to keep a close eye on fishing and tourism, and to add Antarctica to the geography lessons taught in the early grades.

If there were any way to express my full astonishment about the majesty of this huge continent, I would. But you must go there to fully understand how powerful it is.

I will try my hardest to teach others about how magnificent this world is, and how we must preserve it.... After all, it is the only world we have—and it's our home. ❑

> *If there were any way to express my full astonishment about the majesty of this huge continent, I would. But you must go there to fully understand how powerful it is.*

EDITOR'S NOTE: *Students On Ice organizes expeditions to the Antarctic and the Arctic for students from around the world aged from 14 to 18 years old who are enrolled in high school at the time of the expedition. By providing them with inspiring educational opportunities at the ends of the earth, the program hopes to foster a new understanding and respect for our planet. For more information, write to Students on Ice, 1125 Bank St., Suite #2, Ottawa, Ontario, Canada K1S 3X4, call 866-336-6423 (toll-free) or 613-236-9716, fax 613-236-6887 or visit www.studentsonice.com*

British Museum Fails In Bid To Buy Shackleton Flag

***Reuters,* LONDON, 25 Sept 2002, by Jeremy Lovell**—Britain's National Maritime Museum failed on Wednesday in its bid to buy a flag presented to legendary polar explorer Ernest Shackleton by Queen Alexandra in 1914 before he set out in the *Endurance* to cross Antarctica.

"We didn't make it," a spokeswoman for the cash-strapped museum told Reuters sadly after the sale.

A spokeswoman for auction house Christie's said the painted silk standard was knocked down to a private buyer for 116,650 pounds ($182,300), at the lower end of its pre-sale estimate of 100,000 to 150,000 pounds.

It was the second time the state-funded museum had tried and failed to buy the flag—a treasured possession of Shackleton's—for the nation.

As *Endurance* was slowly crushed in the Antarctic ice and the crew ordered to abandon ship, they were banned from taking personal possessions with them because of spac;e and weight considerations.

But Shackleton wrapped himself in the flag and carried it with him throughout the rest of the journey—including his mid-winter, 800-mile voyage in an open boat across mountainous seas from Elephant Island to South Georgia to get help.

"It had great personal meaning to him. The flag is absolutely resonant of Edwardian exploration and adventure," a museum spokesman told Reuters last week, announcing an appeal for funds to buy it.

"We don't want to see it going to a private collector. We have a space already set aside for it in the museum for the whole world to see the flag," he added. Another item from the *Endurance* trip on sale at Christie's auction of 400 years of polar memorabilia was a journal kept by the crew during their long Antarctic vigil.

A copy of the *Aurora Australis*, a pseudo-newspaper written by and for the stranded expedition members to while away the endless hours, was sold for 40,630 pounds—bang in the middle of its pre-sale estimate of 30,000 to 50,000 pounds.

"Polar exploration sales always attract keen interest, but they also come up quite frequently so there is less rarity than for certain other sales," the Christie's spokeswoman said. ❑

Smallest Ozone Hole Since 1988, Scientists Say

***Reuters,* WASHINGTON, 30 Sept 2002, by Deborah Zabarenko**—This year's Antarctic ozone hole is the smallest one since 1988, but this has little to do with earthly activities and much to do with weird weather in the stratosphere, U.S. government scientists said on Monday.

The ozone hole has also split into two pieces, a new wrinkle on a phenomenon that scientists first observed in the 1970s and have tracked as one measure of the impact of pollution.

The 2002 edition of the ozone hole covers about 6 million square miles (16 million square kilometres), well below the 9 million square miles (24 million square kilometres) seen for the last six years at this time of year. Late September is generally the time scientists see the most ozone loss.

"This is smallest ozone hole since 1988, but that's still a lot of ozone loss," said Paul Newman, an ozone researcher at NASA's Goddard Space Flight Center outside Washington.

The ozone layer shields Earth from the sun's harmful ultraviolet radiation, a cause of skin cancer in humans and potentially deadly to crops and animals. Without the ozone layer, there would be no life on this planet.

The small size of this year's ozone hole is caused by unexpectedly large weather patterns in the stratosphere, the layer of the atmosphere some six miles (10 km) to 30 miles (48 km) above Earth's surface where the ozone layer is found.

Normally, stratospheric weather in the extreme southern hemisphere is placid, allowing for a large ozone hole to open up, Newman said. This year, mammoth weather patterns pumped ozone into the south polar region and warmed it up.

"The warm air actually shuts down ozone loss," Newman said in a telephone interview.

The strange stratospheric weather also caused the ozone hole to divide into two lobes instead of staying in one blob generally centered over Antarctica, he said.

The ozone hole is caused by the chemicals chlorine and bromine, which are contained in chlorofluorocarbons and halons, human-made chemicals once used in hair spray, refrigerators and car air conditioners.

Chlorofluorocarbons and halons were banned in 1995 because of their destructive effect on the ozone layer, but they are so long-lasting that at this rate, the ozone hole will not disappear until 2050 or so, Newman said.

The coldest temperatures over the South Pole typically occur in August and September, when thin clouds form and chemical reactions help chlorine and bromine gases to rapidly destroy ozone. By early October, temperatures usually begin to warm, and after that the ozone layer starts to recover.

The National Aeronautics and Space Administration and the National Oceanic and Atmospheric Administration continuously observe Antarctic ozone with a combination of instruments, including balloons and satellites.

The ozone layer around the Arctic gets thin every year but is not considered to have a hole, Newman said.

More information on this year's ozone hole is available online at http:/www.gsfc.nasa.gov/topstory/20020926ozonehole.html ❑

Centerfold: 'MID-SUMMER SCENE'

Artist: Standish Backus • Medium: Watercolor on Paper

Artist's comment: *"Six weeks during December and January comprise the Antarctic summer. On New Year's Day 1956, ships of Operation Deepfreeze One were moored to the ice edge at the outer entrance of McMurdo Sound, some 50 miles from the site of the projected base at Hut Point. Fine weather prevailed at this time, affording surprisingly pleasant hours for leisure groups out on the Ice." — SB*

Old South Pole Station: Tunnel Runs Through It

by Dick Wolak

PHOTO BY MALCOLM BROWNE, NEW YORK TIMES, SUNDAY, DECEMBER 29, 1974, PAGE 2

Frost coats the mustaches, beards and hair of Dick Wolak (left) and George Murray at the South Pole.c

"We are living at the South Pole," proclaimed the *National Geographic* magazine of July(2) new research station built for the start of the International Geophysical Year (IGY) of 1957-58. And though the station was intended for only a few years' use, we were still living there 18 years later, 20 to 30 feet below the snow surface, and always wary of the stresses and strains evident throughout. Those of us who had read Paul Siple's *90 South*, a narrative of that first winter at the South Pole, were thrilled at the opportunity to be a part of this historic facility, even if only for its last austral summer. Some of the events of that last season are recalled here, gathered from reports, journals, logs, letters and pictures recently pulled from their place in the attic.

An enthusiastic group of 30 had gathered at McMurdo Station in late October 1974, excited to be manifested on the opening flight to the South Pole. Included were the first-time-ever civilian winterover support crew, plus civilian and Navy summer support, science personnel and the lead group of Holmes & Narver's (H&N) construction force that would open the construction camp and complete the last phase of the new domed station. On November 1st, all hands were assured that a Pole flight would not be considered before 9 a.m. on the 3rd. Antarctic veterans were not too surprised, then, to be hustled out of breakfast on the 2nd with exhortations to muster hold baggage and clear McMurdo for a 1 p.m. launch for the Pole.

The final wintering party at the original station (soon to be referred to as "Old Pole") was made up of 13 Navy men and 8 civilian scientists. Their winter routines, which had shaped their existence since February 17th, disappeared in the annual madness that is station turnover. Station population on that first night jumped to 49 (two winterovers had departed on the opening flight). The station would be "left alone" by air operations for the next three days to allow the passing of as much operational fact and cultural lore as the two support crews could handle. Typically, by the afternoon of November 5, both groups were scanning the horizon for the second bird of summer and the liberation that it brought to all.

Once turnover was complete, November settled down some. Science personnel flooded in along with many more construction workers, materials, and equipment. The old station, no longer the object of structural or mechanical improvements, gamely carried on. It showed its years in the distortion of buildings, metal arches, and shoring timbers. Its generators were a constant problem, and often irregular in their output. The patchwork of devices used to heat buildings and provide water was notably inefficient in its use of costly diesel fuel. Fuel usage during the '74 winter had been 2,700 gallons per week. The larger, more comfortable new station running generators rated at 250 KW (rather than the old station's 150s) would use 2,000 per week during the '75 winter.

By mid-November, the annual parade of distinguished visitors got under way with the Commander of the U.S. Pacific Fleet (Admiral "Mickey" Weisner), followed by visits of the Under Secretary of the Air Force (J.W. Plummer), the U.S Ambassador to Australia (Marshall Green), a British Antarctic Survey Twin Otter, and the annual media group. Among this last group was the *New York Times*' Malcolm Browne, whose article on Sunday, December 29, would describe "tunnel life" at Old South Pole Station.

> *The Old Station showed its years in the distortion of buildings, metal arches, and shoring timbers.*

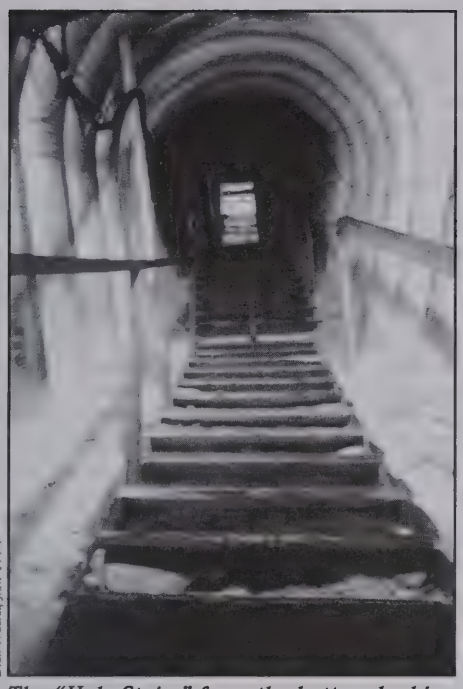
Visits by notables aside, the "events" of this summer all took on a theme of major change. At noon on November 15, the South Pole amateur radio call sign was changed from KC4USN to KC4AAA. In early December, the New Pole generators began testing and were soon considered reliable enough for Pole communications and a support crew of five to move into the new facility on December 14. The "photographic Pole" was moved shortly thereafter, and 1975 saw with the start of amateur radio operations in the Dome, a part of the New Year's celebration.

At that point, our activities took on a very specific focus. Dedication of the new station was scheduled for January 9th, and extensive preparations were needed. On January 3rd, the crashed remains of Hercules #917 (in close proximity to the station the past two years) were pushed by a Caterpillar LGP D-8 far off to the McMurdo end of the skiway. The following day, we celebrated our "last supper," a gala occasion that marked the end of food service in the old station's galley. Four more long days of completion lists and tidying up followed (to include the elaborate spreading of clean snow throughout the construction area). Dedication Day was the last hurrah for Old Pole. All of the visiting party, including representatives of Congress, the National Science Board, SCAR and NSF toured its tunnels. In my view, the most significant visit was that of Mrs. Ruth Siple to her late husband's former workspace.

Old Pole was, of course, "old school" when it came to gender lines. It wasn't until 1969 that the station saw its first female visitors, and a number of other day visitors followed in subsequent summers. However, the total number of "female/overnights" during the station's lifespan was probably no more than 60.

A female reporter was the first to stay a night in 1971 when her media visit experienced an unplanned extension. Two years later, Dr. Harold Muchmore brought his wife, Donna, and Nan Scott with his biomedical program to Old Pole for a two-week stay. He returned with Nan Scott and Lura Ney on the 1974 opening flight to gather data from winterovers, and the group again lived temporarily at Old Pole. The only female support worker to live at the IGY station was McMurdo secretary Jan Boyd, during the first week of January 1975. Her short stay ended the very brief history of women residents at the original station. Two weeks later, the H&N construction secretary at McMurdo, Elena Marty, also worked at Pole, but she lived at the Construction Camp.

The pace during the time that remained stayed at a high level. Two Hercules aircraft were lost at Dome Charlie on January 15th with chilling effects throughout the program. South Pole would receive 50,000 gallons less fuel than planned and would close sooner. Still, the old station pushed on, and remained one of three primary berthing areas. When the core services of food and communications moved out of Old Pole, residents were free to relocate either to New Pole or the Construction Camp on a self-paced



DICK WOLAK, JAN. 1974

The "Holy Stairs" from the bottom looking up toward the vestibule and the "real light" from the snow surface and beyond. Using these stairs was always an adventure. The frozen wood was slippery, and the movement of the surrounding snow and ice kept the stairs significantly "out of square." The altitude at Pole and burden of cold weather clothing made any stair climbing an effort.

The lights at the Old Station finally did go out on February 3.

basis. As their work schedules allowed, individuals could stake out new living space and move their belongings piecemeal. The process would be complete when the mass of transported material favored residence in the new location, whereupon bedding and toothbrush sealed the deal.

On January 24, the population of Old Pole was still at 12, , while 61 others at Pole lived at either the new station or the Construction Camp. A few days later, 3 of 17 men returning to McMurdo left from Old Pole, reducing the number of "tunnel rats" to 9. On the evening of January 30, I finished my fire and generator rounds at Old Pole and was surprised by an unexpected observation. As I prepared for bed, I recounted in my journal that "...movement has started out of the old station...had 8 of 9 move today...actually, I'm the last and only person left living here." I was briefly perplexed, and wondered if that was a good idea; but it was late, I was dog tired, and the mile-long trudge (with bedding) to the new station had no appeal whatever.

When I became the last one out, I guess I was responsible to get the lights. But that didn't happen for several days, as we were moving massive quantities of equipment and supplies from Old Pole, and the heat and power were great benefits. The lights finally did go out on February 3rd. By then, I had moved to the Dome, but was still doing generator watch at the old power plant. At ten that evening, it seemed the time had come. I took a last walk through, lowered the flag at the Holy Stairs* entrance, and pulled the fuel cutoff on the generator.

Back at the new station, I informed the others, and a nostalgia party was declared. In retrospect, perhaps more should have been done in ceremony. But everyone was working at his limit preparing for station closing in less than ten days, and there seemed to be little energy for additional scheduled events. As it was, the original U.S. Amundsen-Scott South Pole Station was toasted well into the night amidst music and movies of the 50's and 60's. It was a sincere and fitting tribute. ❑

Author's Note: **The term "Holy Stairs" at Old Pole applied to the rather twisted, wooden stairway that connected the tunnel adjacent to the medical and communications buildings to the snow surface near the aircraft taxiway and photographic pole. The source of the name is obscure; it was common jargon at Pole in the early '70s. Speculation sometimes attributes the name's origin to the pictures, signs and flags attached to the entrance vestibule and to the use of this entrance by distinguished visitor groups during their day trips to Pole. However, at a station that also had a "Taj Mahal" (berthing building), I like to think the name has a loftier connection. For instance, the stairs' "holiness" might be related to their function of providing the subsurface denizens a means of ascent to the heavenly (and natural) light at the surface far above. Or, perhaps there were exactly 28 steps (very likely), and a devout carpenter recognized their similarity to the Holy Stairs monument in Rome. Those "stairs of Pilate" were moved to Rome from Jerusalem, and their hard marble steps are only climbed by the faithful on their knees. Our devout builder would likely have seen people brought to their knees on the hard, frozen surface of Old Pole's stairs as well!* — **Dick Wolak was South Pole Station Manager in 1974-75. He can be reached at *richard.wolak@uconn.edu***

U.S NAVY (PH1 R.W. MILTON, 1-9-75)

Mrs. Ruth Siple sits in the room that had been occupied by her late husband, Paul Siple, leader of the first winter-over party, 1956-57. Mrs. Siple was at the Pole for the dedication of the new South Pole Station.

Exotic Antarctic Species Face Climate Wipeout

***Reuters,* LEICESTER, England, 9 Sept 2002, by Jeremy Lovell**—Thousands of the world's most exotic species of sea animals, from spiders the size of dinner plates to giant woodlice, face extinction if Antarctic sea temperatures rise as predicted, a scientist said on Monday.

"If the models are correct, we are likely to lose large populations of scallops, giant isopods, bivalve mollusks and giant sea spiders, among others," scientist Lloyd Peck of the British Antarctic Survey told reporters.

"So far we have looked at 11 species, and the answer has come up the same each time. At a temperature rise of two to three degrees, they asphyxiate," he said at the British Association for the Advancement of Science annual festival.

The behemoth-scale giant isopods resemble woodlice but grow to the size of a mobile phone.

Peck said water temperatures around the Antarctic—one of the last outposts of relatively untouched environment in the world—were rising at more than twice the rate of the land temperature, having climbed by one degree in the past 15 years.

Scientific models trying to predict the pace and scale of future change pegged the likely rise at up to three degrees within 100 years.

Surveys have shown that the Antarctic sea dwellers were unable to adapt to such temperature changes so they effectively suffocated due to their inability to move oxygen round their bodies.

Grow Slowly

"These are probably the most fragile group of animals in the world to temperature change," he said. "They grow very slowly, producing only a few generations in 100 years. Yet studies show it takes several generations to adapt."

"Several thousand species of cold-blooded invertebrate animals would be at risk if we get the kind of temperature rise indicated. In this part of the world we have some of the most exotic animals there are," Peck said.

He said there was every possibility that such a wholesale climatic slaughter would have an impact higher up the food chain, but that it was impossible to say just how they would be affected.

He said that while the impact of temperature change on the animals was undoubted, the key lay in whether the predictive models were right.

"The major question is if the models are correct. If they are, things don't look very good," Peck said.

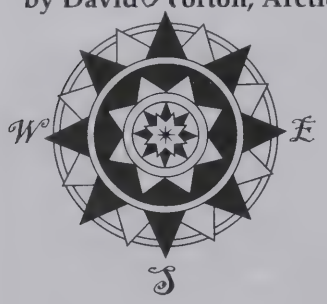
Scientist Andrew Brierley of the University of St Andrews in Scotland said his studies showed that on the plus side of climate change, krill—a basic foodstuff of whales and penguins—might not be as much at risk as previously thought.

He told the same news conference that krill—minute, shrimp-like creatures—had been found to be concentrated at the edge of the Antarctic sea ice and therefore lost relatively little of their habitat as the ice receded with global warming.

"The edge of the sea ice is relatively small compared to the total area of the ice shelf, and that is critical," he said. "A smaller proportion of the krill's habitat is lost than the total." ❑

Due North

by David Norton, Arctic Editor



Lost & Found: A Sense of Place

Anyone who has battled panic during a whiteout, or fought the helplessness brought on by vertigo and loss of horizon, knows that losing one's bearings is dreadful.

Three recent experiences reminded me how precious a sense of place is and how upsetting its loss. First, my wife and I spent a month roaming New Zealand, our first splendid adventure south of the equator. Try as we might, we could not reconcile the sun's daily arc with where our bodies expected it to be. It took our full concentration while sailing to derive rudimentary compass directions from solar cues. We were also slow to grasp the celestial wisdom and logic in Kiwis' observing that soils warm enough to support vineyards were often restricted to their *north*-facing slopes.

Second, the New England house in which I was born and reared (until leaving it 40 years ago for a college dorm) is scheduled for demolition to make way for a mega-mansion on the land. The property left my family's possession when we sold it 18 years ago, but our former neighbors still think of it as ours. Eyes closed, I can visualize nooks and crannies, cellar to attic, every square foot of the half-acre of sloping rocky land, and where the flowers, trees and outcrops stand in relation to one another. I can call to my mind's ear the neighborhood's voices and to my mind's nose its many smells. The developer's mansion and the land it will bury, to all of which only my memory now lays claim, will sell for between $1 and $2 *million*. Such money is obscenely disconnected from all historic bearings on reality. My parents bought the home of my upbringing in the 1930s for less than $10 *thousand*.

The third loss-of-bearings experience was to discover that my graduate research completed 30 years ago is now forgotten or ignored. Over intervening years I got too busy elsewhere to continue investigating how birds go about breeding in the Arctic, nor had I tracked younger folks' research contributions to that subject. Two authors recently sought my help to make their writing more convincing. While catching up on years of my neglected interest in their subject, I couldn't help noticing that a new generation of experts is asking some questions that my graduate work already addressed.

To be sure, graduate student scholarship is often ignored. Consider the late Isaac Asimov. His thrills were teaching and writing, not doing research. To earn his Ph.D. in Chemistry, Isaac nevertheless had had to write a research dissertation. But he was sure that nobody would ever notice or benefit from his graduate research. To test his prediction, he slid a $20-bill into the pages of the bound volume that documented his doctoral research. By academic tradition, that volume can be borrowed from a library at the university whose learned faculty awarded him the doctorate of philosophy. Throughout his life, Dr. Asimov dropped by his *Alma Mater* every few years to fan the pages of the official evidence of his love of knowledge and meritorious research. Always the twenty fluttered reliably to the floor, whereupon Asimov reshelved his money within the book, no doubt pleased at being vindicated.

My Ph.D. dissertation in Zoology would have lost me a $20-bill, had I been able to afford to part with one for the sake of experiment. Unlike Asimov's dissertation, mine circulated and was photocopied several times. But its early use and acceptance sharpens my disappointment. Never discredited, its 163 pages of observations, calculations, graphs and tables would still be useful to today's experts, except that most are unaware of the volume's existence. For weeks I threw myself into boning up on the subject of arctic-nesting birds before gaining enough confidence to help young experts write persuasively about their own findings. Those weeks were full of discoveries and surprises.

Luck, I realized, allowed me to revive grad research memories before they grew too faint, and the chance to speak up before too many public dollars were wasted on work already accomplished. Although my earlier work's absence from thinking and writing by today's biologists disturbed me, I quelled hurt feelings to assess objectively what had happened. For a few years each new contributor to the subject cited my dissertation. Then one important contributor broke the string by failing to cite it. Biologists subsequently dropped the habit of using material from my phone-directory-sized volume. I can imagine their relief, as they found it far easier to cite a slim article that summarized a quarter of my dissertation's findings. Had I stayed involved with their line of research, I might have influenced younger biologists to look at the whole compendium. But I didn't stay, and looking back, I realize that I, too, have overlooked some thick graduate student dissertations that would have strengthened my own understanding.

The deeper I delved into both old and new research, the more it cheered me up. It was gratifying that once upon a time my younger self thought clearly, worked hard, and wrote tolerably. Even now perhaps I could express insights that nobody else had thought of yet. Enhancing the conclusions of recent authors by citing overlooked older efforts would be fun. In the end, I needn't have worried whether doing so would appear self-serving. Other worthy studies have slipped from modern biologists' consciousness. This forgetfulness shows that the lifespan of published research findings is—alas—finite. Prescribing a dose of literature "resurrection" promised to be good medicine.

The last of my steps in re-finding bearings and resurrecting old science was another small discovery. Geezers are invited to predict (in an "outlook" section) which of several research tools ought to dominate the upcoming decade. This geezer surveyed the hot candidates: DNA studies might confirm parenthood among promiscuous arctic birds; miniaturization of transmitters could help satellite-track long distance migrants; numeric modeling may fortify population estimates of breeding birds; and isotope dilution studies could settle questions of birds' energy expenditure. Surprising even myself, I demoted all those sexy approaches to advocate one that is timeless, if less fashionable. Field studies—good old-fashioned natural history observations—are as out of favor these days as pedestrians choking California freeways would be. Yet Yogi Berra stated it clearly in his unique style: "You can observe a lot just by watchin'." In the case of arctic-nesting birds, field observers have long been at a premium. Without the continuity of their hard-won field experiences with arctic birds (here...substitute your own favorite subject), nobody is prepared to apply newer research tools wisely. ❑

Cold Fish

New York Times, 9 July 2002, by C. Claiborne Ray

Q. ***How do Arctic and Antarctic fish survive where the water temperature is in the 40s or lower?***

A. "These fish have evolved adaptations to a very cold environment," said Dr. Kurt Fristrup, assistant director of the Cornell University Bioacoustics Research Program, "and in some extreme cases can survive in salty seawater that is colder than the freezing temperature of their internal body fluids.

"There are two mechanisms," Dr. Fristrup continued. "They either swim around super-cooled or have a way to lower the freezing point of their fluids.

"Fish in a super-cooled state have tissues so cold that they should freeze," he explained, "but there are no seeds to start the crystallization process. If these fish should come into contact with ice, crystals would form, and they would die almost instantly. However, mid-water pelagic fishes—" which live at medium depths in the open ocean "—don't ordinarily come into contact with floating ice."

Second, Dr. Fristrup said, some fish produce proteins in a class called glycoproteins that act as natural antifreeze.

Pond fish of more temperate climates, which may go dormant at 50 degrees because it is hard to find food, or at a lower temperature because the pond freezes over and limits the oxygen supply, have evolved with body chemistries and feeding habits tuned to higher temperatures, Dr. Fristrup said. ❑

OSU Researcher Probes Alaskan Glacier

Anchorage Daily News, **CHITINA, Alaska, by Doug O'Harra**—Seeking clues into Alaska's climate change since prehistoric times and how it might relate to recent global warming, an international scientific team spent the past month drilling deep into ancient ice high in the mountains.

Working from a camp perched in a spectacular 15,000-foot-high saddle between Mount Bona and Mount Churchill, glaciologists from Byrd Polar Research Center at Ohio State University have so far extracted cores from a hole drilled more than 1,500 feet into an unnamed glacier about 250 miles east of Anchorage.

"It's now more than 100 meters deeper than the deepest mountain glacier that they've ever drilled," said Anchorage-based geophysicist John Paskievitch.

Depending on the snowfall rate over centuries, this ice in the St. Elias Mountains might offer a glimpse of the world more than 18,000 years ago, a time when glaciers covered much of the Northern Hemisphere.

Once analyzed in the lab, the trapped air bubbles and dust could yield unprecedented details about weather, volcanic eruptions and climate trends.

Paskievitch talks to expedition leader Lonnie Thompson once or twice a day by satellite phone.

Thompson recently reported reaching a pebbly rock layer some 1,509 feet down, possibly the deepest ice core ever drilled in a mountain glacier.

"They've bottomed out," Paskievitch said. "They are collapsing camp and ... they're ready to come down."

Using drills powered with solar panels and diesel generators, as well as hand augers, the scientists have cut several other holes, including one down to about 450 feet, Paskievitch said. The ice cores have been sliced into hundreds of meter-long cylinders, each about 4 inches in diameter, then stored in insulated boxes buried at the site to stay frozen.

As weather permits, the cores are being flown to a freezer van parked at the state airport near Chitina, then later trucked about 4,000 miles across the continent to Columbus for analysis. The goal will be to build a year-by-year timeline of temperature, snowfall, vegetation and atmospheric chemistry as written layer by layer in the ice between the two peaks.

"It's going very well," said Thompson, speaking during a brief, scratchy satellite-phone conversation from the high camp. "Everything has been ahead of schedule."

The National Science Foundation is underwriting the roughly $450,000 project. ❑

Goose Tracked to Hunter's Freezer

***Associated Press*, TORONTO, 26 Aug 2002**—Scientists spent four months tracking by satellite the journey of a goose named Kerry that migrated 3,000 miles from Northern Ireland to the Canadian Arctic.

They finally found it last week—in an Inuit hunter's freezer.

"Kerry shot in Canada!" reads an Aug. 22 update on the migratory tracking project's Web site.

Kerry was one of six light-bellied Brent geese under study by Britain's Wildfowl and Wetlands Trust and the National Geographic Society.

When signals from Kerry's satellite transmitter showed he had moved from one Arctic island to another and then stopped, the researchers asked Canadian wildlife officers to help find the goose.

An initial search in the wetlands near Resolute Bay found nothing, the Web site reported.

"However, as they reached the town, the transmission signals became stronger and, with the help of the local Wildlife Conservation Officer, they tracked the transmitter to the home of a hunter," said the Web site report.

"The hunter admitted that he had shot Kerry on Bathurst Island on July 22 and had brought the goose back home with him," [the article] said. "This explains why we saw Kerry's transmitter move from Bathurst Island to Cornwallis Island at the end of July."

Of the six birds the project tracked, only three are still sending signals, according to the Web site. ❑

North Pole Marathon Races Planned

Global Expedition Adventures, Inc. has announced that the world's first competitive marathon race at the Geographic North Pole will take place on April 9, 2003. Curtis Lieber, Vice President and North Pole Expedition Director, has confirmed that Richard Donovan of Galway City, Ireland, and Brent Weigner of Cheyenne, Wyoming, U.S.A., will direct the race.

The marathon team will be flown from Longyearbyen, Spitsbergen (Svalbard), Norway, to Ice Base Borneo, a Russian camp situated on the drifting pack ice in the high Arctic Ocean Region near the geographic North Pole. After landing on the 14-foot-thick Blue Ice Runway, the adventurers will spend a day at Camp Borneo preparing for the race. When the weather is clear and all systems are go, the team will board their helicopter flight to the starting line located at the exact geographic North Pole.

After being flown to 90 degrees north latitude, runners will warm up on the Arctic Ice Floe as they circle the world passing through all lines of longitude. A flagged route set up to avoid any leads (open water) and large pressure ridges will mark the runners' course. In addition to the feature event—the classic marathon distance of 42 km (26.2 miles)—athletes will have a choice of running a half-marathon (13.1 miles) or continuing to complete an ultramarathon of 50 kilometres (31 miles). As runners set out on their adventure, they will acclimatize to the rough terrain of snow, ice and small pressure ridges and become familiar with the minus-20 degrees Fahrenheit temperatures. Experienced guides will patrol the quiet expanse of white ice, keeping their eyes open for new leads and the rare polar bear that might threaten the runners' safety. After a few miles, the runners will find their pace, and the athletes will be ready to make history as a new breed of Arctic explorer. ❑

Slip 'n' Slide Glaciers

***Observatory*, by Henry Fountain**—Whoever invented the "Slip 'n' Slide" knew a thing or two about friction—namely that a child in a bathing suit will not get very far gliding on a 20-foot-long piece of plastic in the backyard unless there is a stream of water on it to provide lubrication.

Glaciers and ice sheets do a lot of slipping and sliding as well, and here, too, water plays an important role. Just how important is made clear by research from scientists at the NASA Goddard Space Flight Center and several other institutions.

The researchers measured movement of a part of the ice sheet that covers most of Greenland, using Global Positioning System readings of the displacement of a pole stuck in the ice. They found that the movement accelerated significantly in summer, when a lot of surface ice melted

For example, the researchers found that in the summers of 1998 and 1999 the rate of movement increased by three to three-and-a-half inches per day above the average midwinter rate of 12 inches per day. In the low-melt summer of 1996, however, the rate increased by less than half an inch per day.

The results, the researchers write in the journal *Science*, show that glacial sliding can be affected by the quick movement of water from the surface of the ice sheet to its bottom, probably through crevasses and vertical channels called moulins. Once it reaches the bottom (having traveled about 4,000 feet in the case of .the Greenland sheet), the water provides lubrication between the ice and bedrock.

Previously it had been thought that surface melting would affect movement only slowly, over hundreds of years, as ice thickness changed and altered the stresses at the bottom that help drive the sheet along. The researchers say their work suggests that the effect is much more rapid and that ice movement could be rapidly increased by climate warming. ❑

Alaska, No Longer So Frigid, Starts to Crack, Burn and Sag

NEW YORK TIMES

Joe Perletti is clearing dead trees from around his house as a defense against fire.

New York Times, **ANCHOR POINT, Alaska, 13 June 2002, by Timothy Egan**—To live in Alaska when the average temperature has risen about seven degrees over the last 30 years means learning to cope with a landscape that can sink, catch fire or break apart in the turn of a season.

In the village of Shishmaref, on the Chukchi Sea just south of the Arctic Circle, it means high water eating away so many houses and buildings that people will vote next month on moving the entire village inland.

In Barrow, the northernmost city in North America, it means coping with mosquitoes in a place where they once were nonexistent, and rescuing hunters trapped on breakaway ice at a time of year when such things once were unheard of.

From Fairbanks to the north, where wildfires have been burning off and on since mid-May, it means living with hydraulic jacks to keep houses from slouching and buckling on foundations that used to be frozen all year. Permafrost, they say, is no longer permanent.

Here on the Kenai Peninsula, a recreation wonderland a few hours' drive from Anchorage, it means living in a four-million-acre spruce forest that has been killed by beetles, the largest loss of trees to insects ever recorded in North America, federal officials say. Government scientists tied the event to rising temperatures, which allow the beetles to reproduce at twice their normal rate.

In Alaska, rising temperatures, whether caused by greenhouse gas emissions or nature in a prolonged mood swing, are not a topic of debate or an abstraction. Mean temperatures have risen by 5 degrees in summer and 10 degrees in winter since the 1970s, federal officials say.

While President Bush was dismissive of a report the government recently released on how global warming will affect the nation, the leading Republican in this state, Senator Ted Stevens, says that no place is experiencing more startling change from rising temperatures than Alaska.

Among the consequences, Senator Stevens says, are sagging roads, crumbling villages, dead forests, catastrophic fires and possible disruption of marine wildlife.

These problems will cost Alaska hundreds of millions of dollars, he said.

"Alaska is harder hit by global climate change than any place in the world," Senator Stevens said.

> *"No place is experiencing more startling change from rising temperatures than Alaska."*

Scientists have been charting shrinking glaciers and warming seas in Alaska for some time. But only recently have experts started to focus on what the warming means to the people who live in Alaska.

The social costs of higher temperatures have been mostly negative, people here say. The Bush administration report, which was drafted by the Environmental Protection Agency, also found few positives to Alaska's thermal rise. But it said climate change would bring a longer growing season and open ice-free seas in the Arctic for shipping.

"There can no longer be any doubt that major changes in the climate have occurred in recent decades in the region, with visible and measurable consequences," the government concluded in the report to the United Nations last month.

It does not take much to find those consequences in a state with 40 percent of the nation's surface water and 63 percent of its wetlands.

Here on the Kenai Peninsula, a forest nearly twice the size of Yellowstone National Park is in the last phases of a graphic death. Century-old spruce trees stand silvered and cinnamon-colored as they bleed sap.

A sign at Anchor River Recreation Area near this little town poses a question many tourists have been asking: "What's up with all the dead spruce trees on the Kenai Peninsula?" The population of spruce bark beetles, which have long fed on these evergreen trees, exploded as temperatures rose, foresters now say.

Throughout the Kenai, people are clearing some of the 38 million dead trees, answering the call from officials to create a "defensible space" around houses for fire protection. Last year, two major fires occurred on this peninsula, and this year, with temperatures in the 80s in mid-May, officials say fire is imminent. "It's just a matter of time before we have a very large, possibly catastrophic forest fire," said Ed Holsten, a scientist with the Forest Service.

Joe Perletti, who lives in Kasilof in the Kenai Peninsula, has rented a bulldozer to clear dead trees from the 10 acres where he lives.

"It's scary what's going on," Mr. Perletti said. "I never realized the extent of global warming, but we're living it now. I worry about how it will affect my children."

Mr. Perletti, an insurance agent, said some insurers no longer sold fire policies to Kenai Peninsula homeowners in some areas surrounded by dead spruce.

Another homeowner, Larry Rude, has cut down a few trees but has decided to take his chances at the house he owns near Anchor Point. Mr. Rude says he no longer recognizes Alaska weather.

"This year, we had a real quick melt of the snow, and it seemed like it was just one week between snowmobiling in the mountains and riding around in the boat in shirt-sleeve weather," Mr. Rude said.

Other forests, farther north, appear to be sinking or drowning as melting permafrost forces water up. Alaskans have taken to calling the phenomenon "drunken trees."

For villages that hug the shores of the Bering, Chukchi and Beaufort seas, melting ice is the enemy. Sea ice off the Alaskan coast has retreated by 14 percent since 1978 and thinned by 40 percent since the mid 1960s, the federal report says. Climate models predict that Alaska temperatures will continue to rise over this century, by up to 18 degrees.

Kivalina, a town battered by sea storms that erode the ground beneath houses, will have to

move soon, residents say. Senator Stevens said it would cost $102 million, or $250,000, for each of the 400 residents.

> *"The positive changes from this take a long time, but the negative changes are happening real fast."*

The communities of Shishmaref, Point Hope and Barrow face a similar fate. Scientists say the melting ice brings more wave action, which gnaws away at ground that used to be frozen for most of the year.

Shishmaref, on a barrier island near the Bering Strait, is fast losing the battle to rising seas and crumbling ground. As the July 19 vote on whether to move approaches, residents say they have no choice.

"I'm pretty sure the vote is going to be to move," Lucy Eningowuk of Shishmaref said. "There's hardly any land left here anymore."

Barrow, the biggest of the far northern native villages with 4,600 people, has not only had beach erosion, but early ice breakup. Hunters have been stranded at sea, and others have been forced to go far beyond the usual hunting grounds to find seals, walruses and other animals.

'To us living on the Arctic coastline, sea ice is our lifeline," Caleb Pungowigi testified recently before a Senate committee. "The long-term trend is very scary."

A 20-year resident of Barrow, Glenn Sheehan, says it seems to be on a fast-forward course of climate change.

"Mosquitoes, erosion, breakup of the sea ice, and our sewage and clean-water system, which is threatened by erosion as well," he said. "We could be going from a $28 million dollar sewage system that was considered an engineering model to honey buckets—your basic portable outhouses."

The people who manage the state's largest piece of infrastructure—the 800-mile-long Trans-Alaska Pipeline—have also had to adjust to rising temperatures. Engineers responsible for the pipeline, which carries about a million barrels of oil a day and generates 17 percent of the nation's oil production, have grown increasingly concerned that melting permafrost could make unstable the 400 or so miles of pipeline above ground. As a result, new supports have been put in, some moored more than 70 feet underground.

"We're not going to let global warming sneak up on us," said Curtis Thomas, a spokesman for the Alyeska Pipeline Service Company, which runs the pipeline. "If we see leaning and sagging, we move on it."

North of Fairbanks, roads have buckled, telephone poles have started to tilt, and homeowners have learned to live in houses that are more than a few bobbles off plumb. Everyone, it seems, has a story.

"We've had so many strange events, things are so different than they used to be, that I think most Alaskans now believe something profound is going on," said Dr. Glenn Juday, an authority on climate change at the University of Alaska at Fairbanks. "We're experiencing indisputable climate warming. The positive changes from this take a long time, but the negative changes are happening real fast." ❑

NEW YORK TIMES

NEW YORK TIMES

NEW YORK TIMES

The effects of a seven-degree rise in Alaska's average temperature include buckling highways; shoreline erosion at Shishmaref on the Chukchi Sea, near the Arctic Circle; and forests killed by beetles.

Alaskans Feel Effects of Wall Street's Slide

Associated Press, **ANCHORAGE, 21 Oct 2002**--One of the things that sets Alaska apart from the Lower 48—besides the spectacular glaciers and the long winter nights—is an oil-royalty fund that pays every man, woman and child a big dividend each year just for living here.

But there may be no checks in the mail next year

The Alaska Constitution says the principal of the Alaska Permanent Fund—about $22 billion—cannot be touched. Because of the downturn on Wall Street, the fund has been dangerously close to, and sometimes below, the hands-off mark.

The dividend checks have been mailed out every fall since 1982. This year's payout was $1,540 per person; all told, about 600,000 Alaska residents are splitting $900 million.

The loss of the dividend next year could have a huge effect on Alaska's economy and the lives of its poorer residents, such as fishermen barely holding on in rural villages.

"The dividend helps a small community a lot, because there's no work out here," said Moses Toyukak, one of three employees at the power plant in the village of Manokotak, about 350 miles by air from Anchorage. "I've been putting mine toward housing the last eight years."

Nearly half of Manokotak's 80 families have incomes of $25,000 or less, so the loss of the dividend would cut their family income by 30 percent or more. The average Manokotak family has five people.

For food, villagers catch fish and dry them, and hunt moose and caribou. But their hunting forays are on all-terrain vehicles or snowmobiles, and gas costs $2.45 a gallon.

Pete Andrew is a salmon fisherman in Dillingham, a town of 5,000, in which the cost of living is about 50 percent higher than in Anchorage. Milk is $6 a gallon, cabbage $7 a head.

He has been putting the dividends away for college for his four children, ages 11 through 16. "The focus in the future is going to be college," he said.

The Permanent Fund was set up in 1976 after oil from Prudhoe Bay began flowing via the Alaska pipeline. Royalties paid to the state by the oil companies are put in the fund and invested, about half in the stock market, 40 percent in bonds, and 10 percent in real estate.

In 2000, the fund's value peaked at $27.8 billion, and the dividend that year reached a high of $1,964 for every Alaskan. ❑

Hot On Trail of Tiny Killer In Alaska

M. Scott Moon of New York Times

Spruce bark beetle perched on a fingernail.

SOLDOTNA, Alaska, by Timothy Egan—Edward Berg has a pair of doctorates, one in philosophy and another in botany, but for the last decade he has been a forensic detective in the forest, trying to solve a large murder mystery.

The evidence surrounds him on his home in the Kenai Peninsula: nearly four million acres of white spruce trees, dead or dying from an infestation of beetles—the largest kill by insects of any forest in North America, federal officials say.

Beetles have been gnawing at spruce trees for thousands of years. Why, Dr. Berg wondered, has this infestation been so great? After matching climate records to the rate of dying trees, Dr. Berg, who works at the Kenai National Wildlife Refuge, believes he has come up with an answer.

He says a succession of warm years in Alaska has allowed spruce bark beetles to reproduce at twice their normal rate. Hungry for the sweet lining beneath the bark, the beetles have swarmed over the stands of spruce, overwhelming the trees' normal defense mechanisms.

If Dr. Berg is correct—and he has won many converts as well as some skeptics—then the dead spruce forest of Alaska may well be one of the world's most visible monuments to climate change. On the Kenai, nearly 95 percent of spruce trees have fallen to the beetle. Now, conditions are ripe for a large fire and could lead to bigger changes in the ecosystem, affecting moose, bear, salmon and other creatures that have made the peninsula, just a few hours' drive from Anchorage, a tourist mecca.

"The chief reason why the beetle outbreak has been the largest and the longest is that we have had an unprecedented run of warm summers," said Dr. Berg, 62, a soft-spoken man in suspenders and running shoes. Temperatures in Alaska have risen sharply in the last 30 years, causing sea ice to break up off the northern coastlines, some glaciers to recede and permafrost to melt. But until Dr. Berg began matching rising temperatures to the number of trees killed by beetles, no one had tied the death of a forest nearly twice the size of Yellowstone National Park to warming temperatures.

Dr. Berg believes the larger culprit is global warming, brought on by increased emissions of greenhouse gases, which trap heat in the atmosphere. But that is a bigger debate, one that Dr. Berg is normally not a part of. The implication of Dr. Berg's findings for other forests vulnerable to bugs is that as climate warms in the north, some species of evergreen trees that cover vast acreage could be mowed down by an ever-expanding population of beetles.

The dead spruce forest of Alaska is also a lesson, to some ecologists, of how warmer temperatures present intractable problems for living things anchored to a certain area. People can adapt or even move, but trees that have been growing in one area for 8,000 years cannot—at least not quickly enough.

Other scientists who work on global warming issues are now looking at Dr. Berg's findings.

"His work is very convincing; I would even say unimpeachable," said Dr. Glenn Juday, a forest ecologist at the University of Alaska, "For 'the first time, I now think beetle infestation is related to climate change."

While Dr. Juday did not collaborate on Dr. Berg's spruce studies, he relayed some of the findings at a recent conference on climate change in Oslo, as part of the Arctic Climate Impact Assessment Project, a study by scientists from several nations. It was also presented by Dr. Berg himself in a speech at an American forestry conference this year.

"There is enormous excitement over Ed Berg's studies," Dr. Juday said.

But other scientists are still skeptical, saying it may be only a coincidence that rising temperatures go hand in hand with growing beetle infestations. Some say Berg has found a big piece of the puzzle, but not all of it.

"I think Ed Berg is only partially correct," said Dr. Ed Holsten, who studies insects for the Forest Service in Alaska. The trees on the Kenai are old and ripe for beetle outbreaks. If they had been logged, or burned in fire, it might have kept the bugs down, Dr. Holsten said.

The spruce beetle, which is about a quarter-inch long with six legs, is barely visible to most people who roam through evergreen forests in the West and Alaska. Large swaths of forest in Colorado, Idaho and Wyoming have been felled by the bug. But nothing has approached the Alaska kill.

The beetles take to the air in spring, looking for trees to attack. When they find a vulnerable stand, they will signal to other beetles "a chemical message," Dr. Holsten says. They burrow under the bark, feeding on woody capillary tissue that the tree uses to transport nutrients.

In Dr. Berg's office, he has a cross-section of a tree that has been under attack by beetles. They build a web of canals as they eat. Eventually, the tree loses its ability to feed itself; is essentially choked to death, a process that can take several years, Dr. Berg said.

Spruce trees produce chemicals called terpenes, which are supposed to drive beetles off. But when so many beetles go after a single tree, the beetles usually win. As it dies, the normally green needles of spruce will turn red, and then, in later years, silver or gray. Ghostly stands of dead, silver-colored spruce—looking like black and white photographs of a forest—can be seen throughout south-central Alaska, particularly the Kenai. Scientists estimate that 38 million spruce trees have died in Alaska in the current outbreak. "It's very hard to live among the dead spruce; it's been a real kick in the teeth," said Dr. Berg. "We all love this beautiful forest."

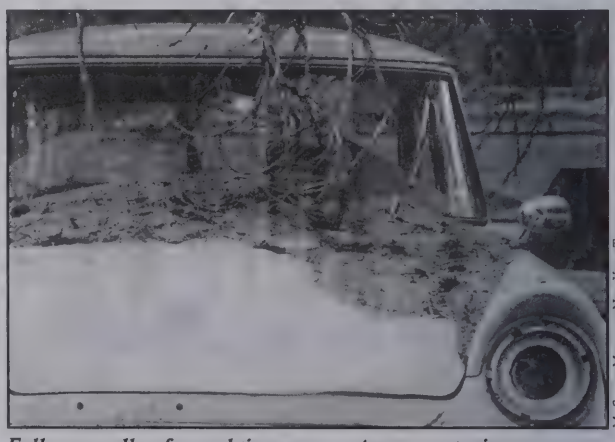
One reason Dr. Berg may have been able to see the larger implications of the beetle attack when others saw only dead trees is that he is one of few government scientists for the Fish and Wildlife Service who is paid to study the big picture.

His title is ecologist for the Kenai refuge. "When they hired me, they felt the need to look at things from a broader scale rather than simply do moose counts," he said.

Working with a doctoral student, Chris Fastie, on a federal grant, Dr. Berg has been matching the volume of dead trees to climate. Since 1987, he said, the Kenai Peninsula has had a string of above-normal temperature years, particularly in the summer. Each of those years coincided with huge outbreaks of beetle infestation and dead trees, matching warmer years and a rise in spruce kills in the early 1970s. Dr. Berg found a similar pattern in the Kluane area of the Canada's Yukon Territory, where it is much colder.

Spruce beetle eggs normally hatch by August, then spend the winter, dormant, in larvae beneath the bark. They can withstand temperatures of up to 35 degrees below zero. The

(Continued next page)



M. Scott Moon of New York Times

Fallen needles from dying spruce trees, covering a car on the Kenai Peninsula, have become common in the area.

Hot on Trail . . .

(Continued from bottom left)

normal life of a spruce beetle—if not picked off by woodpeckers or other birds—is two years. But in the warmer years, Dr. Berg and others found that the beetles were completing a two-year cycle in a single year. This mass of insects has consumed nearly every mature spruce tree on the Kenai, until there is very little left to eat. Most of the trees are more than 100 years old.

Other scientists say the warming climate may be responsible for a big part of the huge bug outbreak, but not all of it.

"These bugs are cold-blooded," Dr. Holsten said. "They are an warning indicator of climate change. If it warms up enough, they can complete that two-year life in a year."

Spruce has grown on the Peninsula for about 8,000 years. Other infestations have killed up to 30 percent of a forested area before bug populations died from fire or freeze or other natural causes. The current infestation never slowed until the beetles ran out of food.

"It slowed down only after had literally eaten themselves out of house and home," Dr. Berg said.

The Forest Service has been studying beetle-killed spruce some time, but has yet to come up with any way of attacking the insects, other than suggestions of logging and controlled-bum fires—each of which is hotly contested.

What may follow in the path of the dead forest will likely be a mix of grasses and more hardwood trees like birch, alder and aspens, said Dr. Berg.

Climate records have been kept for barely a hundred years in places in Alaska. By studying rings—which expand in warmer years and barely grow in cold years—scientists in Alaska say the current warming period is unmatched for at least 400 years. By studying dead trees, they say they can find no evidence of a spruce beetle outbreak of this magnitude, ever. ❑

U.S. to Return Land to Denmark

***Associated Press,* COPENHAGEN, Denmark, 24 Sept 2002**—The United States will return to Denmark a section of the U.S. air base at Thule in northern Greenland, the Danish government announced Tuesday.

For decades, Greenland, a semiautonomous Danish territory, has bristled at U.S. military restrictions on the so-called Dundas area, which is within the base but no longer used.

The local government of Premier Jonathan Motzfeldt wants to give the area back to the Inuit population who consider it an important hunting region.

NATO-member Denmark handles the foreign and defense policy of the world's largest island. Thule is 310 miles south of the North Pole.

In 1951, Denmark and the United States signed a defense agreement setting up four rent-free bases in Greenland. All the bases except for Thule have since been shut down.

When the Thule base was created in 1953, the Dundas area was incorporated as part of a security perimeter and declared a military zone.

The agreement was brokered Monday and made public Tuesday. Details, including the size of the portion to be returned to Denmark, were not announced.

A formal text is to be signed later this year in Nuuk, Greenland's capital. ❑

Your ballot for election of the Board of Governors of the American Polar Society,
along with biographic info on candidates,
was included with this issue.

PLEASE VOTE AND RETURN YOUR BALLOT ASAP!

Senate Wants New U.S. Sea Pact

***Agence FrancePresse,* MOSCOW**—Russia's senate wants the United States to renegotiate a 12-year-old accord demarcating the boundary between the two countries in the Bering and Chukotka seas, a senior lawmaker said yesterday.

Mikhail Margelov, chairman of the Federation Council's Foreign Affairs Committee, said that the s-called Baker-Shevardnadze agreement was too generous to Washington and that it was important for bilateral relations that the issue be resolved.

"We have raised this problem in order to settle it at a practical level, taking into account the national interests of both countries," said Mr. Margelov, who leads a working group charged with revising the 1990 agreement.

The *Itar-Tass* news agency quoted him as saying that a successful renegotiation of the deal "will stop it being fanned for political purposes in the future!'

Then-Soviet Foreign Minister Eduard Shevardnadze, who is now president of Georgia; and the U.S. secretary of state at the time, James Baker, signed the document in Washington in 1990.

The Soviet Union placed under U.S. jurisdiction part of the area of the Bering Strait and of the Chukotka Sea, confirming in exchange its jurisdiction over some other areas of the Chukotka Sea.

However, this varied from the historical sea demarcation line, fixed in 1867, when Russia sold Alaska to the United States. Washington ratified the agreement in 1991, but Russia has. still not done so.

The United States is making full use of the agreement, but it has not legally taken effect for Russia.

As a result, Russian ships are barred from a 200-mile zone transferred to U.S. jurisdiction, but Washington is not allotting to Russia compensation quotas for fishing and marine resources stipulated under the accord.

Russia annually loses as much as $200 million on Alaskan pollack alone, according to *Itar-Tass*.

The Russian upper house is to draw up an address to the U.S. Senate this month, urging joint action to resolve the problem.

However, in case of a U.S. refusal to compromise, Russia has a good chance to prove in court the invalidity of Mr. Shevardnadze's signature, said the chairman of the senate committee for the Russian North, Alexander Nazarov.

"This is a fall-back option," *Itar-Tass* quoted Mr. Nazarov as saying.

Alexander Yakovenko, the-official spokesman for the Russian Foreign Ministry, declined to comment on the lawmakers' initiative but pointed out that an expert government committee had concluded in 1997 that the 1990 treaty was in line, with Russian interests. ❑

Toxins Put Arctic Polar Bears And Humans At Risk

***Reuters,* HELSINKI, Finland, 1 Oct 2002, by Paul de Bendern**—The health of polar bears and the indigenous peoples of the Arctic is at serious risk from man-made toxins being carried there by air and sea, a new report showed Tuesday.

The impact of pollutants traveling to the delicate Arctic environment from other parts of the world is being felt the most by those at the top of the food chain—polar bears and humans, the Arctic Monitoring and Assessment Program said.

"Some Arctic people are among the most highly exposed people on the globe because contaminants accumulate in their foods," said the Norwegian-based group, a unit of the intergovernmental Arctic Council.

The report, presented at an Arctic environment pollution conference in the Finnish town of Rovaniemi, found mercury levels in some Arctic indigenous people are high enough to affect children's development.

It also said mercury levels in some wildlife are increasing while global emissions are not falling.

"Most of these contaminants are produced and used outside the Arctic," the group's chair, Helgi Jensson, said in the report, which was prepared over the past five years by scientists from Arctic countries working with Arctic indigenous peoples.

The group said the Inuit in Greenland and Canada—the indigenous people of the Arctic—have among the world's highest exposures to certain toxic chemicals carried there from far afield.

People with increased risk mainly lived in areas with high intake of marine mammals, such as the Inuit, and those with high intake of some fish species, such as Yup'ik in western Alaska.

> *"They eat the food because it is full of nutrition, but the animals they eat are also contaminated. That's the dilemma."*

"They eat the food because it is full of nutrition, but the the animals they eat are also contaminated. That's the dilemma," the group's executive secretary, Lars Otto Reiersen, told *Reuters*.

He said the lack of elder animals in some populations may be a consequence of pollutants gathered in the Arctic from afar.

"Levels of PCBs in some wildlife are high enough to cause subtle effects on the immune system, and this may even be true for children in some areas. Other PCB-risks include effects on brain development and reproduction," the group said.

PCBs, or polychlorinated biphenyls, are mixtures of chemicals and potentially cancer-causing. They build up in the food chain, especially in fatty tissue like blubber—key nutrition for polar bears and the Inuit. Use of the industrial chemicals is largely banned in the West.

"In the long run, international conventions or protocol are the only ways to reduce the contaminant load in the Arctic traditional foods and thus in people. However, it will take many years before levels decrease, and in the short term, dietary advice may also be prudent," the group said.

Marine mammals, such as polar bear, Arctic fox, harbor porpoise, seals, and birds also suffered from high levels of contamination by persistent organic pollutants that damage the nervous system, development and reproduction. ❑

Alaska White Bear Not in Season

***Associated Press,* ANCHORAGE, Alaska, by Larry Campbell**—When hunting season opens Sept. 1, one special bear will be off limits: a rare white-colored black bear that a photographer spotted near Juneau and turned into a local celebrity.

The Alaska Board of Game ordered an emergency closure on hunting of all "white phase" black bears in the Juneau area. Effectively, that covers only one known white bear, the one photographed earlier this month by Pat Costello.

Costello petitioned the board Thursday, asking that the bear he's dubbed "Spirit Bear" be exempt, and the board ruled Friday.

"People recognize this is a unique animal," Costello said. "They don't want to see it just made into another rug."

Game board Executive Director Diana Cote said the state Department of Fish and Game also supports the ban. Game officials said they had been flooded with calls and e-mail from people who saw Costello's photos on the Internet.

State biologists have known of the bear's existence for a few years. It looks almost like a polar bear but has distinctive raccoon-like markings around the eyes. Experts say it likely is a variation of what biologists call a glacier bear—genetically a black bear, but with a light coat that can run from cinnamon to blue-white.

Glacier bears are scarce, but a bear this white is even more rare. Biologists in Southeast Alaska said they have not seen another like it.

"Actually, there are a lot of different color morphs with black bear. But not quite this white. This is definitely unusual," said Neil Barten, a Department of Fish and Game biologist.

The hunting ban on the white black bear will last at least until a game board meeting Nov. 1, when the board will decide whether to extend it through the end of the hunting season, June 30. ❑

Greenland's Glaciers Crumble

Global Warming Melts Polar Ice Cap Into Deadly Icebergs

***Washington Post Foreign Service*, ILULISSAT, Greenland, 13 Oct 2002, by DeNeen L. Brown**—The iceberg was at his back. Suddenly it began moving like a monster that was waking up. Aqqaluk Lynge, hunting for seal on an ice sheet nearby, looked up in alarm, knowing that these floating mountains off the coast of Greenland, for all their frozen beauty, are ruthless and deadly. So he decided to get moving, he recounted recently. But the engine on his motorboat wouldn't start. Lynge has a special reverence for Greenland's icebergs. A member of the Inughuit native people, he's out on the water often and says the icebergs have become more numerous and more dangerous in recent years, a change he attributes to warming of the global climate.

Icebergs are tongues of glaciers that have broken off and fallen into the sea. That process is called "calving," and it is often announced by a loud hiss of ice crackling and air exploding from ancient ice. Soon after, an iceberg is born and sent into the sea.

If it is spring, the baby will flow away. But if it is winter, it will be rocked and stay near the arms of its mother, the glacier, until spring, when the sea ice melts and opens the way. Once floating in the open sea, it may be unstable, flipping top to bottom. This is the time when it is most dangerous for hunters on the sea.

In recent years, some scientific surveys have shown that more icebergs are slipping into the sea, as glaciers melt faster than expected. Greenland's ice cover, which holds 10 percent of the world's ice, has been thinning, studies have shown.

Scientists are debating why this is happening—whether it's part of global warming or a local phenomenon—but they generally agree that something unusual is going on.

In Greenland, "the higher elevation appears to be stable, but in a lot of areas around the coast, the ice is thinning," said Waleed Abdalati, a manager in the Earth Sciences Department of NASA's Goddard Space Flight Center. "There is a net loss of ice particularly in the south."

In some places, the coastal thinning is proceeding as fast as three feet each year. If this signals a general global warming trend, researchers worry, so much ice could melt that sea levels will rise and flood coastal cities. The U.S. Environmental Protection Agency has warned that water levels may increase 6 to 12 inches over the next century. They have already been rising 10 to 12 inches per century along the U.S. coast.

NASA has been watching the melting of Greenland's ice sheets since 1993, when its scientists conducted airborne studies. "We went back five years later to measure the same locations to see how they changed. It was a snapshot in time of the changes," said Abdalati. "If we can better understand changes, we can better predict what they are likely to be in the future."

Greenland is known for icebergs that seem to lurk behind fog. Visitors come here to Ilulissat to go out to sea, get close to the icebergs and experience their majesty. Nine-tenths of the ice mass hides beneath the sea. Ships must be careful how they navigate these waters.

One of the largest icebergs found here was four miles long. But as ice bergs go, that is small. The true monsters occur in the south, off Antarctica One of the most immense icebergs ever found there measured 200 miles long and 60 miles wide.

Last spring, a huge ice shelf attached to Antarctica snapped off the frozen continent and split into thousands of small icebergs. Scientists, who had been predicting for years that the ice there would snap, were surprised at how fast the break-off happened. "The disintegration of the ice shelf, ice that has been around for thousands of years, now gone and disappearing so quickly—that was a significant event," Abdalati said.

Lynge remembers the fear that chilled him that day when he was hunting near the iceberg

He was out on an ice sheet, chasing a seal. The seal had dived, and Lynge was waiting for it to return to its breathing hole. Patience when seal hunting is essential. So he waited. But the seal never came up. When an animal begins to act strangely, such as not coming up for breath, something tremendous is happening in nature, the native people here say.

Just then he noticed the iceberg moving. If the tip is moving, he knew, it can mean that one end is moving up and the other end is moving down.

Lynge turned instantly and jumped into his motor boat, but it would not start. A friend in another boat nearby quickly gave him a tow. Soon they were speeding away from the iceberg, not waiting to look back.

Behind them they heard it turning. "We looked back and saw the whole iceberg was collapsing, exploding almost," he says. "We were so afraid." Then it flipped, creating a great tidal wave that crashed hard onto nearby shorelines.

By then the two men were out of the wave's path. "When we were finally far away, we could breathe normally again. We were looking back and seeing nothing was left. It exploded underneath the surface of the sea." ❑

Glacier Pushes Avalanche of Ice Onto Village; Scores Missing

***The New York Times*, MOSCOW, 21 Sept 2002, by Michael Wines**—A mammoth chunk of ice split from a glacier in the Caucasus Mountains and swept downhill late Friday, leaving perhaps 100 people dead and a 12-mile trail of devastation across roads, rivers and at least one village in southwestern Russia.

About 500 rescue workers were searching for survivors today, and officials said the missing included the 27 members of a film crew led by one of Russia's most popular directors and actors. They said there was no firm estimate of the number of people who might have been carried away in the avalanche because the area is popular with mountain climbers and hikers.

But Mikhail Shatalov, a senior official in the North Ossetia region where the disaster occurred, told the *Itar-Tass* news agency that the death toll could reach 100.

Aerial views of the disaster area broadcast tonight on Russian television showed a broad river of black mud and debris settled over the otherwise green landscape at the mountains' base.

"The tragedy in North Ossetia is a very grave catastrophe," President Vladimir V. Putin said in Moscow. "What counts now is to find the missing people and restore the structure for supplying the region."

Officials quoted by the *Interfax* news agency said the huge Maili glacier, in the Caucasus peaks on Russia's border with Georgia, had shed a slice of ice up to 100 million cubic feet in size and as much as 330 feet thick.

The glacier broke into house-size chunks as it slid downhill, felling trees, triggering mudslides and blocking at least one river, which threatened to cause floods.

Reuters said the slide clipped one village, Karmadon, burying homes where about 30 people lived. The number of survivors was not known.

Near Gizel, another village, "we thought that water was pouring down," Reuters quoted one resident, Elbrus Doyev, as saying. "When it had all stopped, we came out of our houses and saw huge pieces of ice."

Officials said at least 15 people had been found alive, and nearby tourist centers housing another 60 had been evacuated. Crews were working to bring supplies to two villages that were cut off when the avalanche blocked roads with a six-foot layer of mud and ice.

Among those reported missing were two border guards and a film crew led by Sergei Bodrov Jr., the director of the wildly popular films "Brother" and "Brother 2," about a man who metes out his own brand of justice in the Russia of the lawless 1990s, and later in the United States.

Mr. Bodrov's crew was shooting a movie near the glacier and contacted coworkers outside the avalanche zone about 20 minutes before the disaster. The crew has not been heard from since, a spokesman for the film company told Moscow's news radio station Echo Moskvy. ❑

Rescued Scientists Reach Land

***Washington Post*, CAPETOWN, South Africa, 11 July 2002 (AP)**—More than a month after their ship was trapped by ice near Antarctica, 89 scientists and crew members sailed into Cape Town aboard the South African ship that rescued them.

AGENCE FRANCE-PRESSE

Crew members on the South African ship *Agulhas* chipped at ice as they tried to reach 107 Russian and German scientists and others stranded on a German ship trapped by an ice drift. The ship carried two helicopters ready to ferry out passengers from the stranded *Magdalena Oldendorff*, which had been trying to reach Cape Town from the Novolazarevskaya station in Antarctica when an ice drift forced it to take shelter in a bay.

The German-owned *Magdalena Oldendorff* had been headed to Cape Town from the Novolazarevskaya station in northeast Antarctica when it came across an ice drift and was forced to seek shelter in a local bay.

Stranded in the ice, the Russian scientists and German crew had to endure below-zero temperatures and howling winds as they awaited for help. "I was scared at first, but after two or three days we knew we would be rescued," said Boris Batashevich, a Russian doctor. "The situation was not so bad. We had two months of fuel [and] one month of food."

The South African rescuers sailed from Cape Town on the polar supply vessel *SA Agulhas* and used two specially modified Oryx military helicopters to ferry the 78 Russian scientists and 11 German crew members from the stricken vessel.

Eighteen crew members remained aboard the trapped vessel to help with maintenance and assist when the Argentine icebreaker *Almirante Irizar* arrives to clear a path for it through the ice. ❑

COURTESY VYACHESLAV MARTYANOV, ARCTIC AND ANTARCTIC RESEARCH INSTITUTE OF RUSSIA

The rescue of the *Magdalena Oldendorff*, trapped in ice floes off Antarctica, was the most massive such operation in years. Eventually, helicoptrs from a South African ship extracted scientists and crew members, and an Argentine icebreaker slicedthe ship free.

GIVE THE GIFT OF
American Polar Society Membership!
There is still time to send a unique holiday gift to family, friends or colleagues. See page 31 for details. Use enclosed postcard.

'Prince of Asturias' Prizes Awarded

***New York Times* (excerpt), MADRID, Spain, 26 Oct 2002**—On Friday, Prince of Asturias Prizes—the Spanish-speaking world's version of the Nobel prize—were awarded.

The Scientific Committee on Antarctic Research, based at Cambridge University in England, received one of the eight awards, which was for international cooperation. ❑

Food Species Tracked to Ocean Lair

17 Mary 2002—Krill, the basis of Antarctica's food chain, like to hang out around the continent's edges.

New research shows that the tiny, shrimp-like crustaceans congregate just under the sea ice that surrounds Antarctica. There they are munched by everything from fish to whales and occasionally are harvested by commercial fisheries.

Scientists led by the British Antarctic Survey sent a remote-controlled submarine in search of krill, whose whereabouts had never been pinned down even though they are one of the most abundant species on the planet.

The findings, reported in *Science*, show that the krill are concentrated in a band between half a mile and 8 miles south of the ice edge. ❑

60–40–20 Years Ago In *Polar Times*

by Cliff Bekkedahl

SIXTY YEARS AGO

The December 1942 issue heralds "The New Northwest Passage." The Alaskan Highway was completed on 20 November 1942. The lead article, authored by Ernest Gruening, Governor of Alaska, recounts the long period of planning and the astonishing short span of time required for accomplishment of this record-breaking road building feat. Planning began in 1933 and languished until the outbreak of war, 7 December 1941. Galvanized by wartime requirements, the Army Corps of Engineers and the U.S. Public Roads Administration joined forces (12,000 soldiers and 2,000 civilians) to construct 1,540 miles of road from March to November 1942. "Thousands of trucks will run all winter carrying soldiers and supplies to Alaskan posts," said the Secretary of the Army. Built at the rate of eight miles a day, it involved bridging 200 streams as well as elevation crossings as high as 4,212 feet.

Elsewhere in the 1942 issue

- An article claiming that wolves had reduced reindeer herds from 550,000 animals to 170,000, threatening Eskimo food supplies
- Japanese forces had occupied Kiska and Attu islands in the western extremities of the Aleutian Islands, and U.S. forces were established in the nearby Andreonoff Islands. The focal point for U.S. military operations was located at Dutch Harbor.
- Wartime news addressed several daring rescues of downed airmen all across the northern tier, from the Aleutians to Greenland.

FORTY YEARS AGO

On 20 November 1962 at the South Pole, Rear Admiral David M. Tyree, USN, was relieved by Rear Admiral James B. Reedy, USN, as Commander of the United States Naval Support Forces in the Antarctic. In a departure interview, Adm. Tyree stated that, "So far, through pioneer exploration, the International Geophysical Year work and Operation Deepfreeze, our work has been mostly descriptive—finding out what's here—and actually, we still know little about Antarctica." Responding to questions about future activity in Antarctica, Adm. Tyree said that mineral exploitation was a possibility. Over 100 minerals had been identified in outcroppings, but extreme conditions dictated that only the most valuable or exotic would bear the cost of development. He also offered the opinion that "...despite the harsh environment, tourism is a distinct possibility, especially for camera bugs." Attending the change of command ceremony were Dr. Laurence Gould of the National Science Board and the Reverend Theodore Hesburgh, President of Notre Dame University.• Meanwhile, at McMurdo Station, a water shortage curtailed consumption of potable water, including use in bathing and cooking. The nuclear power plant had suffered a non-reactor casualty and back-up diesel fuel supplies were dwindling. Complicating the situation was the two-week delay in arrival of the annual relief party and resupply ships. Helicopters were being used to airlift drums of diesel fuel from a storage site at Marble Point, some 45 miles from McMurdo.

QUESTION for READERS:

Did anyone have experience at camp century or know of its ultimate disposition? Call or e-mail editor Cliff Bekkedahl.

- **"Moon Colony" on Earth:** Eight hundred miles from the North Pole and 152 miles east of Thule Air Force Base in Greenland, the U.S. Army Corps of Engineers has established an under-the-ice living and working complex accommodating up to 250 persons. Sustaining this experimental facility is a portable atomic power plant, a 1500-kw unit weighing in at 472 tons and costing $6 million.

Seemingly jinxed at the outset with problems, including excessive radiation and difficulties in conventional steam generation and feed water make-up under extreme climate conditions, the plant soon settled down and proved the feasibility of portable nuclear power. Other technological developments included new and innovative measures for cutting, tunneling and maintaining under-ice caverns and equipping the spaces with secure living quarters, laboratories and other working facilities. Ice creep was an unanticipated problem. They found that the walls of the ice caverns closed inward at a rate of 2 to 4 inches per month necessitating constant pick-and-shovel, ice cutting/chipping and chain sawing to maintain the size of the facility.

"Two U.S. Submarines Rendezvous at North Pole." —*Seadragon*, traveling from Pearl Harbor, and *Skate*, out of New London, surfaced at the North Pole on 31 July 1962. Both veterans of previous polar trips, *Skate*, under the command of then-Commander Jim Calvert, USN, was the first submarine to surface at the Pole (17 March 1959), while *Seadragon* had transferred from the Atlantic Fleet to the Pacific Fleet, traversing by way of the North Pole.

TWENTY YEARS AGO

"Commission Votes To Ban Hunting of Whales"—On 23 July 1982, the International Whaling Commission voted to ban all commercial whaling, starting in 1986. After ten years of debate, 25 nations voted in favor of the ban; seven nations voted against (including the Soviet Union and Japan), and five nations abstained. The Commission also voted to decrease the number of whales that may be caught until 1986, when the total ban would go into effect. Exceptions were granted to Eskimos and other native hunters allowing them to continue subsistence hunting. Proponents of the ban contended that populations of many kinds of whales had been in steady decline, and several species were threatened with extinction. Japan, a major whaling country, voted against the ban on the grounds that whale meat is a traditional food, and whaling provides many jobs. The U.S. government sent a strongly worded message to Japan asking them not to defy the ban. President Reagan, a strong supporter of the ban, publicly commended the Commission for its decision. ❑

And Now ... in 2002 ... *'Polar Times'* Frozen in North Carolina

The staff of the *Polar Times* offers apologies for the late arrival of this issue. But we also are counting on a little sympathy from those of you who have ever been stranded in a debilitating ice storm, because that's exactly what happened to our production editor, Charlotte Sinclaire, in early December!

She was just putting the finishing touches on the layout of this issue when the lights went out statewide in North Carolina—and beyond—and stayed out for nearly a week! Production was held up about eight days while she shivered next to her kerosene heater and afterwards pulled her household back together. "It wasn't Antarctica," she said, "but it *felt* like ice with a capital 'I'!"

Of course, the *Times* was safe and warm in Ms. Sinclaire's computer, waiting for her when the ice melted and the power came back on. ❑

Explorer Charles Burton Dies; Circled Globe

***Associated Press,* LONDON**—Charles Burton, a British explorer who took part in the first expedition to circumnavigate the world from pole to pole died July 15 at his home in Farmfield in southeast England after a heart attack.

Burton, who survived life-threatening encounters with a polar bear, an ice floe, glaciers and a fire during the expedition, was of a small group that sailed the River Thames from London on Sept, 2, 1979, to begin the three-year journey. It followed the imaginary meridian that connects the Royal Observatory in Greenwich, where longitude and Greenwich Mean Time are calculated, to the North and South poles.

The Transglobe Expedition group—which included leader Sir Ranulph Fiennes; former brewery salesman Oliver Shepard; Fiennes wife, Virginia; and their family terrier Bothy—was described by patron Prince Charles as "refreshingly mad."

The adventure lived up to its billing as the "toughest journey on Earth" when the group was attacked by a polar bear, stranded on a glacier when its snow vehicles caught fire, marooned for three months on a drifting ice floe and severely burned: by. the sun when trudging through the desert.

From London, the explorers headed south through Europe, across the Mediterranean and the Sahara to Cape Town, South Africa, where they picked up a boat to reach Antarctica.

After several months of living in a cardboard hut and engaging in scientific research, the three men set off on the 900-mile trek to the pole, leaving Lady Fiennes behind to make radio contact.

The first leg was relatively smooth, despite Mr. Burton's fall down a crevasse. The explorers became only the third from Britain—after Robert Scott in 1912 and Sir Vivian Fuchs in 1958—to reach the South Pole when they arrived Dec. 15,1980.

As they turned north, Shepard dropped out for personal reasons, and Mr. Burton used a short stop in Sydney to marry his fiancée, Thelma Petts.

Mr. Burton, Fiennes and [Fiennes'] wife then sailed across the Pacific and up the west coast of North America, negotiating the Yukon and Mackenzie. rivers to enter Canada's Northwest Territories. There, the two men left Lady Fiennes behind to set up a base camp.

It was on the northbound leg that the pair ran into their greatest difficulties. Mr. Burton lost the soles of his feet as they skied over glaciers but suggested that they rest only when he fell and struck his face on a rock.

As they raced French and Norwegian parties to the North Pole, a fire destroyed much of their supplies and, on one occasion, Mr.. Burton clutched Fiennes' snowmobile with frozen hands as it sank into open seawater while his companion rescued vital pieces of equipment.

They eventually arrived at the Pole, celebrating their success ahead of the Norwegians and French with "a nicely chilled magnum ."

But in their frantic bid to make Spitzbergen Island before the Arctic ice melt, they became stranded on an ice floe and were forced to shoot a polar bear when it joined them.

After drifting for three months, they met their ship and made it back to Greenwich on Aug. 29, 1982, ending a 52,000-mile journey.

Mr. Burton, the son of a commander in the Royal Navy, was born Dec. 13, 1942, and went to Millfield, a boarding school, before joining the Royal Sussex Regiment.

He later helped Fiennes plan other expeditions but never went himself.

He is survived by his wife, Thelma. ❑

Charles Mallory, 76, Took Part in Expedition to Antarctica

***Baltimore Sun,* 12 July 2002, by Frederick N. Rasmussen**—Charles William Mallory, who accompanied Admiral Richard E. Byrd on his last Antarctic expedition and later retired as senior technical adviser to Westinghouse Electric Corp., died of leukemia Saturday at North Arundel Hospital. He was 76.

The 37-year resident of the Chartwell community in Severna Park was a newly commissioned ensign when he joined Adm. Byrd's final Antarctic expedition in 1946.

During the three-month tour to the Antarctic that extended into 1947, Mr. Mallory was a member of a 4,000-man team that conducted scientific experiments and explored the vast wastes at the bottom of the world.

He participated in the construction of Adm. Byrd's Little America IV research station and, a year later, returned as staff construction officer for Operation Windmill.

Because of his role in a mapping expedition along Antarctica's Knox Coast, Mallory Point was named for him by Adm. Byrd, said Mr. Mallory's son, Michael Joseph Mallory of Baltimore.

Mr. Mallory returned to the Antarctic in 1962 and 1963, overseeing the construction of the nuclear power plant at McMurdo Station.

In addition to his son, Mr. Mallory is survived by his wife, the former Anne Duffy, whom he married in1950; two sisters, Nadine Kammer and Bonnie Reid, both of Brewster, Kan.; and two grandchildren. ❑

Photographers Killed in Plane Crash

***Associated Press,* BISHOP, Calif., 12 Aug 2002**—Nature photographers Galen and Barbara Rowell, whose works were published in *National Geographic*, *Outside* and many books, were killed in a plane crash in the eastern Sierra Nevada.

The twin-prop Aero Commander went down early Sunday morning about two miles south of Bishop Airport, said Inyo County Sheriff's Deputy Paul Baldwin.

The pilot, Tom Reid, 46, and another passenger, Carol McAfee, both of Bishop, also died in the crash, according to the Inyo County coroner's office.

Investigators from the Federal Aviation Administration and the National Transportation Safety Board were at the scene Monday, but no details on the cause of the crash were released.

The Rowells had been returning from a photo workshop in the Arctic, said Kevin Calder, an employee at the couple's gallery, Mountain Light Photography. They moved their gallery and home to Bishop—about 230 miles north of Los Angeles—about 18 months ago after years in the San Francisco Bay area, he said.

Galen Rowell, 61, was the author of 18 books of photography, and his pictures appeared in such magazines as *Audubon*, *Outdoor Photographer* and *Sports Illustrated*.

"It's one thing to take a pretty picture, but he was able to bring back pictures that gave you a feel for the land, a feel for the expedition," said Kent Kobersteen, director of photography for *National Geographic*, "They communicated emotionally and verbally."

Barbara Rowell, 54, was a photographer, pilot and former director of public relations for The North Face Inc., the outdoor clothing company. She was also president of their gallery.

The couple had returned to California on a commercial flight to Oakland, then boarded the charter flight to Bishop, about 210 miles to the east. ❑

DavidHopkins, 79, Authority On Land Bridge of First Ice Age

***The New York Times,* 14 Nov 2001, by Wolfgang Saxon**—Dr. David Moody Hopkins, an arctic geologist and leading authority on the land link that allowed ice age hunters to pursue their mammoth and mastodon prey from Siberia to Alaska nearly 12,000 years ago, died on Nov. 2 at his home in Menlo Park, Calif. He was 79.

The cause was kidney failure, his family said.

Dr. Hopkins's work centered on the western Arctic during the last ice age. When he began his fieldwork on the Seward Peninsula in the early 1940s, the region's geology was mostly unknown to scientists. His name became associated especially with the Bering Land Bridge which lay across the drained, 55-mile-wide Bering Strait during the last ice age.

Dr. Hopkins edited and contributed to "The Bering Land Bridge," an anthology published in 1967, that remains in print. He was a co-editor and contributor to "Paleoecology of Beringia" (1982), a book about an area referring to the two shores of the Bering Sea.

Born in Nashua, N.H., he graduated from the University of New Hampshire in 1942. He received his master's (1948) and doctorate (1955) from Harvard.

He worked as a research scientist for the United States Geological Survey from 1942 to 1984. From then until his retirement in 1994, he was a professor at the University of Alaska.

He was among the first American scientists to work cooperatively with counterparts in the Soviet Union, and Dr. Hopkins worked there as an exchange fellow of the National Academy of Sciences in 1969. This permitted him to carry on his field studies in Siberia.

Dr. Hopkins is survived by his wife of 31 years, Rachel Chouinard Hopkins; two daughters and a son from previous marriages, Dana Hopkins of Palo Alto, Calif., Dr. Chindi Peavey of Castro Valley, Calif., and Alexander, of Reno, Nev.; three stepsons, Vincent Stanley of Santa Barbara, Calif., Christopher Stanley of Bainbridge Island, Wash., and Gregory Stanley of Fairfield, Calif.; a brother, Dr. Daniel Hopkins of St. Charles, Mo.; a sister, Dona White of Elephant Butte Lake, N.M.; and eight grandchildren.

His first wife, Joan Prewitt Hopkins, died in 1955. His second marriage, to Martha Bryant Hopkins, ended in divorce. ❑

400 Attend First OAEA Reunion

By Billy-Ace Penguin Baker

Early in 2001 the Pensacola Group of the Old Antarctic Explorers Association (OAEA) began discussing a reunion, with Pensacola being the city of choice in which to hold it. A special edition of the OAEA quarterly, *Explorer's Gazette*, was published in January 2002 announcing the Pensacola 2002 Symposium/Reunion to the OAEA membership at large. At that time, the OAEA membership had grown to over 300 members and the reunion committee anticipated attendance would approach 400 members and guests.

The dates of the Symposium/Reunion were from November 6-8, 2002. On Thursday morning, 7 November, there was a Board of Directors meeting to determine agenda items for the general membership meeting to follow. It was decided to have symposium/reunions every two years, with the next being held in 2004 in California, in the Port Hueneme/Point Mugu area. Then, in 2006, the next gathering will be held in Rhode Island in the Quonset Point/Davisville area. It is anticipated that every third Symposium/Reunion will return to the Gulf Coast—birthplace of the OAEA.

Highlights of the reunion included an organized tour of the National Naval Aviation Museum on November 7. The museum prominently displayed the *Que Sera Sera*, and OAEA members were allowed to go aboard the aircraft and use it as a backdrop for group photos. An added bonus of the tour was a full rehearsal of the upcoming Blue Angels' "Home Coming Air Show."

On Friday morning, a memorial service was held for the 58 individuals who lost their lives in Antarctica from 1946–1999 while participating in Operation Highjump or Deep Freeze.

Later in the day, the main guest speaker was Dr. Karl Erb of the Office of Polar Programs, who gave an interesting presentation on the United States Antarctic Program. After a Q&A period, a second guest speaker, Ted Dettmar, gave an outstanding lecture and slide show on Shackleton.

That evening the guests indulged in a sumptuous luau followed by a no-host reception. Highlights included drawings and raffles for numerous prizes and an awards ceremony.

This Symposium/Reunion had two very unusual items with deep roots in the history of the United States Antarctic Program. The first was a special postal cancellation for the event. The Pensacola OAEA Group supplied each attendee with a pre-printed envelope featuring the reunion logo, and the Pensacola Post Office supplied three people who cancelled envelopes with the OAEA Reunion postmark for each day of the reunion.

The second item was a limited supply of beer brewed especially for the OAEA First Reunion. The beer was brewed by a local microbrewery to our specification and fitted with a label of our design. The inclusion of this beer was reminiscent of the New Zealand Bavarian Beer that was brewed especially for Operation Deep Freeze. All 80 cases were purchased and consumed with great gusto.

Overall, the reunion was a great success and a grand experience for all attendees.

For more information about the OAEA visit our web site at: **http://www.oaea.net** or write to: **OAEA Secretary/Treasurer, Old Antarctic Explorers Association, Inc., 4615 Balmoral Drive, Pensacola, FL 32504.** ❑

Membership Chairman Letter

Interesting mail arrives at the Membership Center almost daily. In addition to dues checks (one out from McMurdo in late August on the first plane!), members send photos (one of the *Polar Stern* from a Healy crewmember; others of the *Healy*), and questions (e.g., is the Polar Society interested in hearing about a dog sledge trip north of Ganaag, Greenland?). Lots of last issue's Business Reply Cards have arrived with names of new members or recipients of gift memberships. And of course a *flood* of inquiries flowed in when the new printing company for *The Polar Times* inadvertently subtracted four years from the dues expiration date on nearly everyone's mailing label.

Mail goes out too. Annual dues notices went to about 600 of you in late October. Last year's gift membership recipients won't be billed until February though, in case some of you wonder if you've been forgotten. The October notices included a reminder that donations to the Polar Society (tax deductible in the U.S.) are always welcome and help us avoid future dues increases.

Our membership numbers continue to climb slowly. We stand at just 1100 now, up about 1% a month since I set a goal of 2000 members early last year. The Membership Drive continues, so please use or distribute the Business Reply Cards appearing again in this issue. Consider giving gift memberships (now at half price to new members!) to friends, colleagues, parents, children, grandchildren, or the library at your favorite high school, college or university.

Longtime member Tom Hutchings continues to allow use of the credit card facilities at his *Antarctic Connection* web site. This means that members anywhere in the world may pay their Polar Society dues by credit card via his web site. New members can join the same way. Simply go to **www.antarcticconnection.com**, click on Retail Store, Books, Subscriptions, and follow the prompts. If you have questions, please phone me at (319) 338-3457 or send me an email at **ampolars@mchsi.com**. Membership information is also available at our own web sites: **www.americanpolarsociety.org** and **www.geocities.com/-oaedks/amerpolr.htm**

The Membership Drive still includes sending complimentary bundles of the *Polar Times* to men and women on the polar ships *Healy, Gould, Palmer, Polar Star* and *Polar Sea,* and in Antarctica to Palmer, McMurdo, Scott, and South Pole stations. Beginning with the last issue, we are also sending complimentary copies for distribution to some of the future generation of polar researchers studying at 25 of our leading academic institutions. Young people, like these receiving complimentary copies, are the future of the American Polar Society. I know all current members join me in extending a cordial invitation to become dues paying members, now at the special introductory rate of $7.50 for 2003 and $15 for 2003 and 2004.

Best wishes,

Bob Kremenak

Purpose of APS

"The purpose of the American Polar Society is to bring together people interested in research and exploration in the Arctic and Arctic; to preserve the record of polar research and exploration; and to support and encourage research and exploration in polar and polar-like regions. Toward these ends, the Society will collect and disseminate information about polar regions; compile written records, oral histories, maps, photographs, film and video, and electronic information relating to polar regions; aid organizers and members of polar expeditions; and maintain contact with scientists, explorers, research institutions and interested parties." ❑

About Your Annual Dues

The Board of Governors has set the dues structure for the year 2000 and after as follows:

Annual Dues: Rate $15 (Outside U.S. $17)
Library Dues: Rate $20 (Outside U.S. $22)
Annual Corporate: Rate $100
Life Membership: $250 (Outside U.S. $270)

Each member's dues include a subscription to *The Polar Times*. The dues for each calendar year are payable, in advance, on receipt of a direct-mail statement, mailed each October from the Membership Center. Blue and white dues envelopes are no longer included in Fall-Winter issues of *The Polar Times*. If you have paid your dues ahead, for future years, you will not receive the annual statement until your dues are about to expire.

Address changes are entered in our membership file as we receive them, as are dues payments. Each member's entry includes the date of dues expiration. Mailing labels for *The Polar Times* are printed from this file, with the dues expiration date at the top of each label. You can see whether you are ahead or behind with your dues by looking at the mailing label. If you are a Life Member, that designation will appear at the top of the label instead of a dues expiration date.

We honor all dues paid in advance for future years, at the current rate, but upon expiration, new rates, if they have been adopted, will apply.

Multiple year dues payments are welcome and encouraged, as are donations to the Society. The American Polar Society is a tax exempt organization as defined by Sec 501 (C)3 of the IRS Code. ❑

OUR BACK COVER

Commander Richard E. Byrd, USN, dressed in furs, with his dog, Igloo, outside a hut during his Antarctic expedition, 12 April 1930. ❑ ***(photo courtesy of the United States Navy)***